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NERVOUS AND MENTAL EFFECTS OF THE SULFONAMIDES

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Sulfanilamide was first synthesized in 1908 by Gelmo. From that time until 1932, when Domagk demonstrated that azosulfamide (prontosil) could protect mice against streptococci, the drug was relegated to a relatively unimportant niche among the azo dyes. After Domagk reported his results in 1935, however, this new antibacterial agent became generally known, and since then the story of sulfanilamide and the other sulfonamide derivatives has become common knowledge.

At one time or another, one of the sulfonamide derivatives has probably been exhibited in every illness known to man. Newer and more effective derivatives are constantly being brought out, and disease after disease falls before the progress of the new chemotherapy. As with other dramatic new treatments, however, the toxic effects of these drugs are being neglected among a welter of favorable reports. The effects of this group of drugs on the nervous system has hardly been investigated, yet the nervous system is frequently injured.

Earlier theories of the mode of action of sulfanilamide suggested that it stimulated the defense forces of the body, so that phagocytosis of pathogens was increased. This theory has been discarded, and it is now generally agreed that the drugs are primarily bacteriostatic. These compounds in some way interfere with the rate of growth of bacterial cells, possibly through disturbance of the enzyme system within the cell. The discarded theory had to assume that the toxic effects of the drugs were side effects unrelated to the beneficial action, but it is not unlikely that many of the toxic effects are an integral part of the effect of the drugs on cells, whether bacterial or human. It is possible that the synthesis of new multipotent derivatives will be brought to a standstill by the disappointing discovery that the more toxic these drugs are to bacteria the more toxic they are to the human cell.

The kidneys serve as the major excretory channel for the absorbed drugs. Great caution should be used when one prescribes the sulfonamide drugs for patients with impaired renal function. When toxic manifestations do arise, increasing the fluid intake will expedite the elimination of the drug from the body.

It is now fairly well established that the toxic symptoms of nausea, vomiting and diarrhea, which so often accompany the administration of sulfonamides, originate in the central nervous system. Headaches, tinnitus and dizziness occur frequently in persons receiving any one of the sulfonamides. It does not follow, however, that the magnitude of these reactions is an accurate indication of the seriousness of the toxic effects of the drugs on the nervous system. It will be seen that some of the least nauseating drugs produce the most damage to the nervous system.

It is convenient to consider the drugs individually, with the neurotoxic effects of each.

AZOSULFAMIDE (NEOPRONTOSIL)

Azosulfamide was used only a short time and was then supplanted by sulfanilamide. Cornwall [1] reported a case of mild dysmorphopsia, with auditory and visual hallucinations, following the use of azosulfamide.

SULFANILAMIDE

After applying solid sulfanilamide directly to the arachnoid of rabbits' brains, and after also injecting it into the cortex, Russell and Falconer [2] concluded that the slight damage seen was a foreign body reaction to the particulate substance and not in any way specific to the drug.

There are quite a few reports concerned with the toxicity of sulfanilamide for the nervous system of animals. Long and Bliss [3] noted that after prolonged administration of sulfanilamide to mice spastic paralysis and symptoms of vestibular dysfunction developed. Hawking [4] gave intraperitoneal injections of sulfanilamide to 10 rabbits. In all these animals extensor spasms developed from which 7 recovered completely and 3 died. The animals that died showed damage to the anterior horn cells and to some midbrain cells. Rosenthal [5] and Nelson [6] found that repeated doses of sulfanilamide to rabbits and hens caused symptoms suggestive of a peripheral neuritis (somewhat similar to triorthocresyl phosphate neuritis). Their histologic studies showed mild peripheral neuritis in 20 per cent of the rabbits and 33 per cent of the hens. Eighteen per cent of the hens also showed slight damage to the spinal cord. Bieter and his asociates [7] gave hens large

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1. Cornwall, L. R., in discussion on Weitzen.[8]
2. Russell, D. S., and Falconer, M. A.: Local Effects of Sulfonamides on Rabbit's Brain, Lancet **2:** 100-101 (July 27) 1940.
3. Long, P. H., and Bliss, Eleanor A.: Para-Amino-Benzene-Sulfonamide and Its Derivatives, J. A. M. A. **108:** 32-37 (Jan. 2) 1937.
4. Hawking, Frank: Pharmacological Action of Sulfanilamide, Lancet **2:** 1019-1020 (Oct. 30) 1937.
5. Rosenthal, S. M.: Some Toxic Effects of Repeated Administration of Sulfanilamide and Sulfanilyl-Sulfanilamide to Rabbits and Chickens, Pub. Health Rep. **54:** 96-106 (Jan. 27) 1939.
6. Nelson, A. A.: Histopathological Changes in Hens and Rabbits Following Administration of Sulfanilamide and Sulfanilyl Sulfanilamide (Di-Sulfanilamide), Pub. Health Rep. **54:** 106-127 (Jan. 27) 1939.
7. Bieter, R. N.; Baker, A. B.; Shaffer, J. M.; Seery, T. M., and Orr, B. A.: Nervous Injury Produced by Sulfanilamide and Some of Its Derivatives in the Chicken: Preliminary Report, J. A. M. A. **116:** 2231-2236 (May 17) 1941.

doses of sulfanilamide, sulfapyridine, sulfathiazole, sulfamethylthiazole, sulfanilyl di-methyl-sulfanilamide and sulfaphenylthiazole for two weeks. Sulfanilamide caused the mildest injury to the nervous system of any of the sulfonamides used in this experiment. The damage was limited in the case of sulfanilamide to very mild changes in the peripheral nerves in 66 per cent of the animals and to a slight change in the posterolateral myelin sheaths of the spinal cord in 16 per cent.

As sulfanilamide has been used longer than any of the other members of the group now in general use, it is not surprising that many more reports of its clinical toxicity are available.

A mild depression or euphoria occurring during the use of this drug is common. A more localized cerebral effect may cause peculiar syndromes such as the case of severe dysmorphopsia (without other mental changes) reported by Weitzen.[8] In this case there were angular and curvilinear distortions, so that objects looked like the images seen in the "trick" mirrors of side shows. Distance perception was disturbed, and telopsia and micropsia occurred. The dysmorphopsia disappeared two days after the drug was withdrawn. Higgins[9] reported a case in which aphasia, agraphia and stammering appeared three times, each time on the third day of sulfanilamide medication. The patient was otherwise normal mentally during the medication, and the syndrome disappeared quickly after the drug was withdrawn.

When cortical depression progresses further, frank psychoses occur as a result of sulfanilamide therapy. A review of the literature reveals that 13 cases of psychoses following sulfanilamide therapy have been reported.[10] It is probably true that many more abnormal mental reactions have occurred than have been reported, because frequently this reaction is taken as a matter of course. In these 13 cases the drug had been administered for periods varying from fifteen minutes to forty days. In 2 cases the reaction appeared on the first day. Most of the psychoses appeared from three to ten days after drug therapy had been started, but in 2 cases the psychosis appeared after the drug had been discontinued, in 1 fourteen days later and in the other four days later. Several of the patients had had sulfanilamide before or had been given an interrupted course of the drug. It is interesting to speculate whether this intermittent administration might not have caused a sensitization to the drug somewhat like that seen in the use of protein materials. The average daily dose ranged from 3 to 8 Gm., with most of the patients receiving an average daily dose of about 4 Gm. One patient[11] would become so irrational, confused and excited ten to fifteen minutes after receiving a single dose of the drug that restraints were necessary. This train of events occurred three different times. Usually the picture in sulfanilamide psychoses is that of an ordinary toxic psychosis with confusion, disorientation, depression or euphoria, auditory and visual hallucinosis and distractibility. Paranoid trends are not infrequent. As in other toxic psychoses, the particular manifestations probably depend somewhat on the prepsychotic personality of the patient. The psychosis usually clears up promptly following the discontinuance of the drug. Residual changes were not noted in most of the cases reported, but 1 patient[12] died. In this instance the toxic symptomatology appeared two weeks after the drug had been stopped.

Case 1 illustrates the usual type of toxic psychosis seen after the administration of sulfanilamide:

CASE 1.—H. E., a man aged 58, a professor, had a partial gastric resection for peptic ulcer on Nov. 15, 1938. On November 22 a septic type of fever developed and his urine was found to be severely infected. He was given 5 cc. of 2.5 per cent of azosulfamide (neoprontosil) intramuscularly at 6:45 p. m. on November 26. No particular mental abnormality was noted. Between 4 and 8 p. m. of the next day (November 27) he was given, by intravenous administration, 5 Gm. of sulfanilamide dissolved in 5 per cent dextrose. At 10 o'clock the nurses reported that he was "talking at random and could not talk coherently." He had to be observed continuously, and sedation with paraldehyde was necessary. The following day he was irrational and was talking nonsense such as "I am an equation; you're the denominator; that's the numerator." He appeared apprehensive and was disoriented. On the afternoon of November 28 he was clear enough to answer questions by nodding his head, but he would speak when urged, answering questions with "yes" and "no." The next morning he was drowsy and wanted to know where he was, but that afternoon, although there was a slight dysarthria, his mind was entirely clear. From that time on no mental abnormality was noted. In this case attention should be called to the fact that only one dose of sulfanilamide was given intravenously and that the patient's psychosis appeared six hours after the drug was started. It is entirely possible that the small dose of azosulfamide sensitized him to the later dose of sulfanilamide. The psychosis had entirely cleared up within thirty-six hours after the drug had been stopped.

The next report is that of a case of schizophrenia which appeared to have been precipitated by sulfanilamide:

CASE 2.—G. B., a white schoolgirl aged 21, was admitted to the Neuropsychiatric Institute on Dec. 15, 1941. She was the oldest of three children and had been somewhat spoiled. The family history was not remarkable. For three days following birth she had been anuric, and since then there had been frequent diurnal and nocturnal enuresis. She had talked in her sleep, had masturbated frequently and had expressed a wish to be a man like her father. Her interest in church work was such that at a Bible camp she had "consecrated her life as a Christian worker." Her friends described her as conscientious, cheerful, sweet and well liked. The enuresis disappeared in the winter of 1940 but returned in the spring of 1941. Shortly before she left for Chicago to attend a Bible institute, Sept. 3, 1941, she started taking alternating courses of sulfanilamide and methenamine. From September 1 to about September 7 she took 0.6 Gm. of sulfanilamide four times daily (taking 0.3 Gm. of sodium bicarbonate with each dose). Then for about two weeks she left off the sulfanilamide (and sodium bicarbonate) and took 0.6 Gm. of methenamine and 0.3 Gm. of ammonium chloride four times a day. A two weeks course of sulfanilamide (and sodium bicarbonate) came

8. Weitzen, Hyman: Dysmorphopsia During Course of Sulfanilamide Therapy, Arch. Neurol. & Psychiat. **46:** 369-370 (Aug.) 1941.

9. Higgins, W. H.: Motor Aphasia, Agraphia and Stammering Following Use of Sulfanilamide, Virginia M. Monthly **67:** 216 (April) 1940.

10. Pearson, M. M., and Burnstine, M. D.: Psychoses Precipitated by Sulfanilamide: Report of Two Cases, Arch. Neurol. & Psychiat. **42:** 775 (Oct.) 1939. Toller, R. B.: Psychoses Due to Sulfanilamide, California & West. Med. **53:** 266-267 (Dec.) 1940. Waugh, J. R.: Psychosis During Administration of Sulfanilamide, Am. J. Syph., Gonor. & Ven. Dis. **25:** 504-507 (July) 1941. Hogan, B. W., and McNamara, P. J.: Psychosis Precipitated by Sulfanilamide, U. S. Nav. M. Bull. **36:** 60-61 (Jan.) 1938. Danziger, L.: Delayed Toxic Reaction to Sulfanilamide, Bull. Johns Hopkins Hosp. **63:** 340-344 (Nov.) 1938. Pearson, M. M., and Burnstine, M. D.: Psychosis Precipitated by Sulfanilamide, Internat. Clin. **3:** 246-248 (Sept.) 1939. Garvin.[11] Ottenberg.[12]

11. Garvin, C. F.: Complications Following Administration of Sulfanilamide, J. A. M. A. **113:** 288-291 (July 22) 1939.

12. Ottenberg, Reuben: Clinical Experiences with Sulfanilamide Therapy with Special Reference to Toxic Effects, New York State J. Med. **39:** 418-430 (March 1) 1939.

next and was followed by another two weeks course of methenamine and ammonium chloride. On about October 19 she again started sulfanilamide (and sodium bicarbonate) and continued this until October 22, when abnormal mental symptoms developed. On October 22 she became enuretic in class, was very much embarrassed and left precipitously. She told her housemother that she had been masturbating, that she felt dead all over and that all her female organs were rotting away. She felt dead and frozen, sinful and hopeless and said that the Bible condemned her. She kept tapping her head "to see whether it was dead or alive," and she constantly picked at her hands and arms. On admission to the Neuropsychiatric Institute physical examination was essentially negative except that a smooth liver was felt on deep inspiration. A neurologic examination was negative. There were no indications suggestive of a peripheral neuritis. The urologic consultant felt that the patient probably had an uninhibited neurogenic bladder. The test for blood sulfanilamide was negative. The hematology was normal and urinalysis, bromsulphalein liver function tests, spinal fluid examinations and skull roentgenograms were negative. She complained of confusion and difficulty in thinking and said that her head felt tired and her chest and abdomen empty. She was quiet, withdrawn and did not appear to have hallucinations. Orientation and memory were good. A psychometric examination revealed an intelligence quotient of 103, but the psychometrist expressed the opinion that her intelligence had originally been around the 125-130 level. A Rorschach analysis was interpreted as indicating catatonic schizophrenia with strong depressive elements. While in the hospital she expressed many feelings of self accusation and futility. She continued to pick at her hands and arms and complained that her skin felt numb and that her body was dying. Her status was generally unimproved throughout her hospitalization. Electric shock therapy was recommended but her relatives did not agree to this, and they removed the patient from the hospital, against advice, on Feb. 4, 1942.

In this case the administration of the sulfanilamide had been intermittent, and a rather typical schizophrenic reaction appeared shortly after she had started on her third course of the drug.

Peripheral neuritis is one of the more common complications of the nervous system after the use of members of the sulfonamide group of drugs. Sulfanilamide itself, however, produces neuritis less often than other derivatives. Waugh [13] reported on the frequency by saying that he had observed only 1 case of peripheral neuritis among 650 patients treated with sulfanilamide. In Waugh's case,[13] painless neuritis of the left anterior tibial nerve developed on the second day of the third course of sulfanilamide therapy for gonorrhea. Symptoms of neuritis had not been noted during the previous (longer) courses of sulfanilamide. The average daily dose was 4.4 Gm. The drug was withdrawn soon after the neuritis appeared; physical therapy was started, and in five or six weeks 30 per cent of function had returned. In Janet's case [14] the neuritis was of the arm and thorax and lasted three days. Ornsteen and Furst [15] reported that weakness of adduction of the thighs, a waddling dystrophic gait and a patchy distal hypesthesia of the legs developed in 1 case one and a half months after a course of combined sulfanilamide and fever therapy. Garvey, Jones and Warren,[16] however, noted a similar syndrome occurring after the use of fever therapy whether sulfanilamide was used or not. They observed that the spinal fluid protein was elevated in these cases and compared the picture to the Guillain-Barré syndrome. It therefore seems probable that sulfanilamide had nothing to do with the occurrence of neuritic symptoms in the cases reported by Garvey and his associates and by Ornsteen and Furst.

Fisher and Sidney [17] reported 2 cases of encephalomyelitis following the use of sulfanilamide. In their first case 1 Gm. of sulfanilamide was given daily for thirteen days. Two days after the drug was stopped symptoms of a transverse myelitis developed at the first lumbar segment. There was pleocytosis of the spinal fluid. The sensory level ascended to the second thoracic segment in two days and the patient died a respiratory death. Postmortem examination showed softening of the cord substance, and vascular lesions of thrombosis, congestion and hemorrhage were prominent in the small vessels of the nervous system. The vessel walls showed fibrinoid necrosis and were surrounded by areas of demyelination. Since this patient had lupus erythematosus, it is not altogether certain that the transverse myelitis was due to the sulfanilamide. In their second case radicular pains, weakness and increased reflexes in the right lower extremity developed after sulfanilamide therapy. These symptoms persisted even after the drug had been discontinued. This patient had received 3 Gm. of sulfanilamide daily for six days before the symptoms developed. Norbury [18] reported a case of transverse myelitis developing in a patient receiving an average daily dose of 3.3 Gm. of sulfanilamide for eight days. Hematoporphyrinuria was present. Some recession of the syndrome occurred six days after the drug had been discontinued, and recovery was complete in six months.

Bucy [19] has reported a case in which a toxic optic neuritis developed three times after a single 0.3 Gm. tablet of sulfanilamide, and each time the symptoms would subside after the drug had been withdrawn. It is noteworthy that this patient had had two previous courses of sulfanilamide without the development of symptoms of optic neuritis.

Transitory myopia developing acutely in the course of sulfanilamide therapy has often been reported.[20] Vision usually returns to normal within forty-eight hours after the drug has been stopped. Most investigators agree that the symptom is due to a swelling of the lens, either as an allergic reaction to the drug or as a result of a difference between the osmotic tension of the lens and the aqueous (this difference being caused by unequal distribution of the drug within the eye).

SULFAPYRIDINE

Russell and Falconer [2] found that sulfapyridine in solid form produced irritation of the rabbit brain only as a foreign body, not in a specific manner. It was somewhat more irritant than sulfanilamide owing to its greater insolubility. Bieter and his associates [7] found

13. Waugh, J. R.: Peripheral Neuritis During Administration of Sulfanilamide, Am. J. Syph., Gonor. & Ven. Dis. **23**: 745-750 (Nov.) 1939.
14. Janet, Jules: Protest Against Sale of Sulfanilamide Over the Counter, Paris letter, J. A. M. A. **110**: 1501 (April 30) 1938.
15. Ornsteen, A. M., and Furst, William: Peripheral Neuritis Due to Sulfanilamide, J. A. M. A. **111**: 2103-2104 (Dec. 3) 1938.
16. Garvey, P. H.; Jones, Nathaniel, and Warren, S. L.: Polyradiculoneuritis (Guillain-Barré Syndrome) Following the Use of Sulfanilamide and Fever Therapy, J. A. M. A. **115**: 1955-1962 (Dec. 7) 1940.
17. Fisher, J. H., and Sidney, M. B.: Encephalomyelitis Following Administration of Sulfanilamide, Lancet **2**: 301-305 (Aug. 5) 1939.
18. Norbury, F. G.: Gonorrheal Myelitis with Associated Porphyrinuria Following Sulfanilamide, J. Lab. & Clin. Med. **25**: 270-274 (Dec.) 1939.
19. Bucy, P. C.: Toxic Optic Neuritis Resulting from Sulfanilamide, J. A. M. A. **109**: 1007-1008 (Sept. 25) 1937.
20. Blankstein, S. S.: Transitory Myopia: A Complication of Sulfanilamide Therapy, Am. J. Ophth. **24**: 895-899 (Aug.) 1941. Friedman, B. B.: Acute Myopia Induced by Sulfanilamide, Am. J. Ophth. **24**: 935 (Aug.) 1941.

that chickens given sulfapyridine in high concentrations for two weeks showed more injury to the nervous system than those given sulfanilamide but less injury than those given any of the other sulfonamides tested. Of the chickens given sulfapyridine, 91 per cent showed patchy swelling or condensation of the myelin sheaths of the peripheral nerves, but the changes were mild in all except 3. In these 3 chickens, the myelin sheaths and axons had partially disappeared. One spinal cord showed a slight change in the posterior columns (sheath swelling), but all the brains were normal.

Johnstone and Forgacs [21] reported on the administration of sulfapyridine (the sodium salt given intramuscularly) to 5 children suffering from meningococcic meningitis. In these patients cerebral symptoms of confusion, restlessness and irritability persisted after the spinal fluid had become normal, and in some instances meningeal signs persisted. Rapid improvement occurred in these symptoms when sulfapyridine was discontinued. Those patients died who did not have the drug withdrawn. He stated that if meningeal and cerebral symptoms persist three days after sulfapyridine therapy is started, these symptoms are probably due to the drug.

Pluegge [22] refers to a case of sciatica due to sulfapyridine reported in the German literature and to 2 cases of encephalomyelitis reported in the American literature as being due to the same drug. Pluegge himself reported that a patient received sulfapyridine for seven days (average dose 3 Gm. daily) and on the twenty-sixth day polyneuritis of the femoral, tibial and peroneal nerves developed. There were no sensory disturbances, but areflexia was noted in the involved area. Therapy did not help the neuritic symptoms. He also reported that another patient was suffering from meningococcic meningitis and was treated with sulfapyridine. Six weeks after the spinal fluid became normal weakness and ataxia appeared, and loss of tendon reflexes in the legs was noted, and two weeks later bladder symptoms developed. All neurologic complications were improving when the patient was seen three months later.

Something should be said about the dangers of intraspinal injections of the sulfonamides,[23] particularly sulfapyridine and its sodium salt. Injections of sodium sulfapyridine are caustic and have been known to cause necrosis of the spinal cord at the level of the injection.

SULFANILYL SULFANILAMIDE (DI-SULFANILAMIDE)

Sulfanilyl sulfanilamide, or di-sulfanilamide, fortunately was not released for general use in the United States. In Europe it was widely used under the name "disulon." At the present time it has fallen into disrepute principally because of the number of reports concerned with its toxicity for the nervous system. Rosenthal [5] and Nelson [6] in this country found that the drug produced less clinical evidence of weakness in rabbits than sulfanilamide, but microscopic studies revealed that lesions of the peripheral nerves were four times as frequent with di-sulfanilamide as with sulfanilamide.

Instances of peripheral neuritis due to this drug have been reported.[24] The clinical picture of this neuritis is fairly constant. From one to three weeks after a long or short course of sulfanilyl sulfanilamide pain suddenly appears in the calves, and sometimes in the arms. This pain frequently disappears in a few days, but a day or two after its onset, weakness of the hands and feet appears. This progresses until, in severe cases, there is a veritable distal quadriplegia, which is particularly pronounced in the extensor muscles. The adductor pollicis is almost always more affected than any other muscle, and a reaction of degeneration may sometimes be noted in the thenar muscles. Sensory changes are slight or absent. The deep tendon reflexes in the distal parts of the extremities are usually lost, but they may be hyperactive.[25] Recovery is slow but may become complete in from several weeks to nine months, depending on the severity of the process.

DI-METHYL DI-SULFANILAMIDE

In the studies of Bieter [7] comparing the toxicity of the various sulfonamides, di-methyl di-sulfanilamide was more toxic to the nervous system than sulfanilamide, sulfapyridine, sulfathiazole or sulfamethylthiazole. In the animals given di-methyl di-sulfanilamide, each peripheral nerve examined showed fragmentation and vacuolization of the myelin sheath and damage to the axons. Six of the 11 spinal cords examined showed extensive damage, 1 cord being completely destroyed transversely. Six of the brains showed vascular damage and swelling of the neurons.

This drug, like sulfanilyl sulfanilamide, was given a short clinical trial in the United States, and its deleterious effects were so great that it was never distributed generally. In Europe, however, it found some general use until it was observed that many cases of peripheral neuritis folowed its use. Bannick, Brown and Foster [26] used this drug in 32 cases, and peripheral neuritis occurred in 2. In each of these only the lower extremities were involved. The neuritis from this drug seems to disappear more rapidly than it does with sulfanilyl sulfanilamide. In 1 case, however, recovery was not complete in sixty days. Most of the cases of polyneuritis due to this drug [27] are reported in the

21. Johnstone, D. F., and Forgacs, P.: Cerebral Symptoms Occurring During Sulfapyridine Treatment of Meningococcal Meningitis, Brit. M. J. **1:** 772-774 (May 24) 1941.

22. Pluegge, H.: Ueber zentrale und periphere nervöse Schäden nach Eubasinum-medikation, Deutsche Ztschr. f. Nervenh. **151:** 205-219, 1940; abstr., Arch. Neurol. & Psychiat. **46:** 927 (Nov.) 1941.

23. Germain, A., and Picard, P.: Méningite necrotique subaiguë, consecutive à l'injection intrarachidienne de 693 en solution sodique dans un cas de méningite cérébro-spinale, Bull. et mém. Soc méd. d. hôp. de Paris **56:** 670-672 (Nov. 25) 1940. Fort, P., and Igert, M.: Paralysies graves au cours de la méningite cérébro-spinale (6 cas): danger des injections d'a (para-amino-benzène-sulfamido) pyridine ou M. & B. 693 par voie intra-rachidienne, Presse méd. **48:** 693-695 (Sept. 4-7) 1940.

24. Reese, H. H.: Editorial Comment, Yearbook of Neurology, Psychiatry and Endocrinology, Chicago, Year Book Publishing Company, 1939, p. 71. Wigton, R. S., and Johnson, S. H.: Peripheral Neuritis Following Sulfanilyl Sulfanilamide (Di-Sulfanilamide), J. A. M. A. **111:** 1641-1642 (Oct. 29) 1938. Hodgson, E. R.: A Case of Peripheral Neuritis Following Disulfanilamide Treatment, Journal-Lancet **61:** 22-23 (Jan.) 1941. Tietze, A.: Periphere Lähmungen nach Ulironbehandlung, München. med. Wchnschr. **85:** 332 (March 4) 1938 (quoted by Wigton and Johnson). Alyea, E. P., and Daniel, W. E.: Treatment of Sulfanilamide-Resistant Gonorrhea with Sodium Sulfanilyl Sulfanilamide, J. Urol. **42:** 864-873 (Nov.) 1939. Roch, Martin and Neeser.[25]

25. Roch, M.; Martin, E., and Neeser, J.: Syndrome neuroligique, simulant la sclérose latérale amyotrophique, provoque par un medicament sulfamidé, Bull. et mém. Soc. méd. d. hôp. de Paris **55:** 885-887 (June 2) 1939.

26. Bannick, E. G.; Brown, A. E., and Foster, E. P.: Therapeutic Effectiveness and Toxicity of Sulfanilamide, J. A. M. A. **111:** 770-776 (Aug. 27) 1938.

27. Hermann, K.: Polyneuritis Following Treatment with Uliron, Ugesk. f. læger **102:** 809-810 (Aug. 1) 1940. Le Roy, A.: Polynévrite toxique provoquée par l'ulirone, J. belge de neurol. et de psychiat. **39:** 729-734 (Nov.) 1939. Burawski, J.: Disorders of Peripheral Nerves Caused by Di-Sulfanilamide, Polska gaz. lek. **18:** 446-447 (May 14) 1939. Radermecker (Mme.): Polynévrite consecutive à un traitement d'ulirone, J. belge de neurol. et de psychiat. **39:** 349-356 (May) 1939. Lemke, R.: Ueber Neuritis nach Ulironmedikation, München med. Wchnschr. **85:** 452-453 (March 25) 1938 (quoted by Wigton and Johnson[24]). Euler, H. E.: Zur Ulironfrage, München. med. Wchnschr. **85:** 623-625 (April 29) 1938 (quoted by Wigton and Johnson[24]). Hüllstrung, H., and Krause, F.: Polyneuritis nach sulfanomidhaltigen Verbindungen bei Menschen und Tauben, Deutsche med. Wchnschr. **64:** 114-116 (Jan. 21) 1938 (quoted by Wigton and Johnson[24]). Rost, Joachim: Polyneuritis nach Ulironmedikation, Monatschr. f. Psychiat. u. Neurol. **100:** 92-97, 1938; abstr., J. Nerv. & Ment. Dis. **90:** 654 (Nov.) 1939.

European literature, in which the drug was used under the names "uliron," "diseptal" and "D 373."

Two cases of fatal myelomalacia due to the use of di-methyl di-sulfanilamide have been reported.[28]

SULFATHIAZOLE

Bieter's work[7] showed that sulfathiazole was intermediate in nervous toxicity between sulfapyridine and di-methyl di-sulfanilamide. There was some injury to all the peripheral nerves of the chickens examined, but in only 3 was the damage advanced. Microscopic studies revealed that 6 of the 11 spinal cords had swelling of the myelin sheaths and axons, and some cords showed demyelination and fragmentation of all the neural elements. In 4 of the brains mild demyelination and changes in the endothelium of the vessels were present. Bieter and his associates also reported 2 cases of peripheral neuritis due to sulfathiazole. Their first patient had received sulfathiazole steadily for five and one-half months. Seven weeks after sulfathiazole had been started nerve deafness appeared in the left ear. A few days later peroneal weakness and foot drop appeared on the right. When the drug was withdrawn some motor improvement was noticeable in two weeks. Their second patient had received 27 Gm. of sulfathiazole in five and a half days, when the drug was stopped because numbness and tingling in the hands appeared. The symptoms quickly disappeared after the drug was stopped.

Weinberg and Knoll[29] noted a syndrome occurring in the course of sulfathiazole therapy which they thought resembled amyotrophic lateral sclerosis. It appears, however, that the syndrome they described is quite different from amyotrophic lateral sclerosis and resembles more a mild peripheral neuritis. The patient complained of cramps in the arms and hands and of tremors and clumsiness of the hands. Fibrillations were noted in the thenar muscles and in the forearm muscles. The symptoms would promptly disappear when medication was withdrawn and recur when the drug was started again. The last time the drug was used they gave vitamin E concurrently with the sulfathiazole, and as the syndrome did not appear they felt that vitamin E had prevented the recurrence of the syndrome. Bloom, Leech and Shaw[30] reported a case of temporary blindness due to sulfathiazole. The opthalmoscopic examination showed tortuosity and dilatation of the retinal vessels, and small petechial hemorrhages and crystal-like spots were present around the macula. After the drug was stopped vision returned to normal in about ten days.

The following cases illustrate the toxicity of sulfathiazole for the nervous system.

CASE 3.—M. A., a white woman aged 64, was admitted to the University Hospital in coma on Nov. 11, 1941. While the patient was recovering from minor injuries sustained in an automobile accident on September 14 pleuritic pain developed, for which she was given sulfathiazole. From October 10 to 16 she received 36 Gm. of sulfathiazole. Then the drug was discontinued for two days because of nausea and vomiting, but on October 18 it was started again and by October 29 she had received a grand total of 69 Gm. Sulfathiazole was not given after October 29. On November 5 a sore throat developed. On November 6 she took a single 0.2 Gm. tablet of sodium propyl-methylcarbinyl allylbarbiturate (seconal), became stuporous and remained so until admission to the University Hospital. Her relatives said that for three or four years she had had severe tremor of the extremities, particularly on intention. On admission, the rectal temperature was 106 F., the pulse rate 140, the respiratory rate 44 (Cheyne-Stokes type) and the blood pressure 98 systolic and 58 diastolic. Hematologic studies showed 85 per cent hemoglobin, 4,400,000 erythrocytes and only 1,200 leukocytes, of which 2 per cent were neutrophils, 97 per cent lymphocytes and 1 per cent monocytes. There were dirty gray ulcers on the hard palate and in the right nostril. The patient was semicomatose but would nod her head in answer to questions, or would even speak a few words when urged. A neurologic examination soon after admission showed sensation to be intact as far as could be determined. The corneal reflexes were absent and there was an exposure keratitis. The pupils were irregular and the right was slightly larger than the left. There was a minimal central paresis of the right side of the face, and the tongue and jaw deviated to the right. There was a paresis of the right extremities with some spasticity. The deep tendon reflexes were increased on the right and absent on the left. Mayer's sign was absent on the right and present on the left; Hoffmann's sign was more distinct on the right, and definite Chaddock and Oppenheim signs were obtained on the right. Jacksonian convulsive movements were present in the right lower extremity from time to time. Roentgenograms of the skull and an examination of the spinal fluid were negative. The patient was treated with blood transfusions, pentose nucleotide and liver extract, and by November 10 the leukocyte count had risen to 9,000. The following day she conversed with nurses and relatives but was still a little confused. A neurologic examination on December 3 disclosed some inattention to the right side of the body, and possibly some slight confusion of laterality, but no other signs of aphasia. She was perfectly oriented but was definitely facetious and could not repeat more than four digits forward. The pupils were now equal though irregular. There was slight drooping of the right corner of the mouth but no definite facial paresis. There was mild generalized paresis of the right extremities with slight increase in tone on the right. The deep tendon reflexes were more active on the right, but no pathologic pyramidal signs were present. Gross intermittent tremors (somewhat like those of paralysis agitans) were present in the hands. The patient continued to improve after this date, and at the time of discharge on Dec. 24, 1941 she was in good general physical and mental condition except for an evident paralysis agitans syndrome with tremor, loss of associated movements and masking of the facies.

This case illustrates the toxic effect that sulfathiazole may have on a previously diseased nervous system.

Case 4 is another illustration of the toxicity that sulfathiazole has for the nervous system:

CASE 4.—F. W. M., a white man aged 60, was admitted to the University Hospital on Dec. 24, 1941. On November 15 he had had right-sided pleuritic pain with fever, and he received a course of sulfathiazole, the exact duration and amount of which is unknown. When he was admitted to the University Hospital he was complaining of dyspnea and general malaise, and a diagnosis of empyema was subsequently made. The admission blood count showed 60 per cent hemoglobin, 3,630,000 erythrocytes and 1,150 leukocytes. The whole stained smear contained only 37 leukocytes, of which 35 were lymphocytes and 2 were monocytes. A neurologic examination on the day of admission showed vibratory appreciation to be lost bilaterally

28. Schurert, Martin: Todesfall infolge Rückenmarks eriveichung nach Uliron (Kombinationschadigung), Dermat. Wchnschr. **107:** 1361-1366 (Nov. 19) 1938. Santo, Erwin: Ueber eine schwere Erkrankung des Ruckenmarkes nach Uliron-behandlung einer Gonorrhoe, Frankfurt. Ztschr. f. Path. **53:** 105-119 (March 22) 1939.

29. Weinberg, M. H., and Knoll, A. F.: Beneficial Effect of Vitamin E on Amyotrophic Lateral Sclerosis Syndrome Precipitated by Sulfathiazole, M. Rec. **152:** 447-448 (Dec. 18) 1940.

30. Bloom, W. A.; Leech, M. P., and Shaw, W. S.: Temporary Blindness Due to Sulfathiazole, J. Missouri M. A. **38:** 202-203 (June) 1941.

as high up as the iliac crests. There were numerous patches of chorioretinitis in both fundi; the left corneal reflex was less active than the right; there was a definite paresis of the lower portion of the left side of the face, and there was slight tremor of the tongue. The patient had had a conduction deafness in the left ear for many years. Owing to debilitation, tremulousness was apparent in all movements of the extremities. The right triceps was absent, but otherwise the upper deep tendon reflexes were normal. There was a suggestion of atrophy in the first interosseous space bilaterally. The patellar reflexes were hyperactive and equal and the achilles reflexes absent bilaterally. There was a slight Chaddock sign on the right and a definite Babinski sign was elicited on the left. There were no definite motor abnormalities. The patient was given pentose nucleotide and blood transfusions, and the leukocyte count rose rapidly, until on December 28 it was 5,000 and on December 29 it was 28,000. Immediately after this rise the blood count returned to normal. His empyema was drained successfully and he was discharged Jan. 20, 1942 in excellent general condition. When he returned for a check-up on February 21, another neurologic examination showed that there were healing patches of exudate in the fundi and that there was still a very mild paresis of the lower part of the left side of the face. There was a coarse tremor of the tongue and of the outstretched hands. There was slight ataxia on the finger to nose test. The left lower extremity showed slight spasticity; vibratory sensation was reduced at the right ankle and lost at the left; the ankle jerks were hyperactive but equal, and there was a suggestion of a Babinski sign on the left. The examination was otherwise normal.

In this case, it is true, there is a possibility that the central nervous signs might have been due to emboli (the retinal findings were suggestive of emboli), but there were no other clinical evidences of embolic phenomena. In both case 3 and case 4, neutropenia was well defined, and the question may arise as to whether the nervous and mental symptoms might not have been due to the neutropenia rather than to the direct toxic effect of the drug on the nervous system. The papers of Hunter,[31] Reznikoff [32] and Kracke,[33] which are concerned with the syndrome of granulocytopenia alone, make no mention of nervous or mental complications of this disease.

Case 5 illustrates the abnormal mental reactions and psychoses sometimes seen during the use of sulfathiazole.

CASE 5.—H. V., a white man aged 57, cut his face while shaving on Jan. 7, 1942. On Jan. 10 cellulitis of the right side of the face developed and on admission to the University Hospital on January 13 there was intense inflammation of the right side of the face. The temperature was 103.8 F., the pulse rate 120 and the respiratory rate 25. He showed evidence of general toxemia with mild confusion and slight lowering of the level of consciousness. Diabetes mellitus was discovered soon after admission, and when the patient was told of this illness on the third hospital day he became mildly depressed. During the first five days of his stay in the hospital he received 6 Gm. of sulfathiazole daily. In addition, on the fifth hospital day prior to incision and drainage of the cellulitis he received an additional dose of 2 Gm. of sulfathiazole. Several hours after the operation he became quarrelsome, resistive, aggressive, profane and generally uncooperative. He refused to remain in bed, insisted on walking to the bathroom and, when urinals were brought into his room, would throw them down the hall toward the nurses' desk. In spite of this he seemed oriented and would take medication when it was brought to him. The next day (January 18, or the sixth hospital day) he was definitely facetious but was perfectly oriented and not so aggressive. There was some blunting of superficial sensation in the peripheral parts of the extremities, and vibratory sensation was slightly reduced at the left ankle. There was slight weakness of adduction and abduction of the fingers of both hands, and also of dorsiflexion of both feet. The biceps, triceps, radial-periosteal, patellar and achilles were absent bilaterally. A diagnosis of sulfathiazole intoxication was made; sulfathiazole was withdrawn and sulfadiazine substituted in doses of 6 Gm. daily. From this time on he was also given 20 mg. of thiamine hydrochloride, 20 mg. of nicotinic acid amide and 0.1 Gm. of ascorbic acid, each four times a day. Within thirty-six hours after the sulfathiazole had been withdrawn all mental abnormalities disappeared. Although the patient could not remember the exact details, he knew that his behavior had been objectional and apologized for this profusely. From this time on he was cheerful and cooperative. Examination on the seventeenth hospital day revealed that all the deep tendon reflexes had returned, and sensation and strength in the hands and feet were normal. Glycosuria practically disappeared after the sixth hospital day, and the diabetes was completely controlled when he was discharged in excellent general condition on the forty-ninth day.

It seems likely that the abnormal mental reactions of this patient after the operation were due mainly to the sudden increase in the blood sulfathiazole level resulting from the extra dose of 2 Gm. of sulfathiazole. The signs suggestive of peripheral neuritis may have been due to the sulfathiazole, or they may have been associated with the diabetes. The toxic effect seemed to be specific for sulfathiazole in this patient, as all symptoms subsided after sulfadiazine was substituted.

SULFAMETHYLTHIAZOLE

Bieter's studies [7] showed that sulfamethylthiazole was only slightly more toxic to the nervous system of chickens than sulfathiazole, the changes being a little more advanced with the former drug. Brown and Herrell [34] treated 106 patients with sulfamethylthiazole, and in 3 patients they noted a "lower motor neuron" disturbance manifested by foot drop, which appeared one to two weeks after the drug had been stopped. Pain in the calves immediately preceded the foot drop. One patient also had weakness of the thumb and forefinger bilaterally. Only 1 of their patients had an interrupted course of sulfamethylthiazole therapy. Applebaum [35] observed a case of peripheral neuritis which came on six days after withdrawal of sulfamethylthiazole. In this case, bilateral weakness of the adductor pollicis was the first symptom, but it was soon followed by bilateral pain in the calves and bilateral foot drop. The drug was continued, regardless of the neuritis, and eventually a very distinct distal quadriplegia developed. At that time there were sensory changes in the extremities. The patient had had other sulfonamides before. Garvin [36] reported that a patient had tenderness and hypesthesia of the legs on the seventeenth day of sulfamethylthiazole therapy and then, two days after the drug was stopped, became disoriented, had several generalized convulsions

31. Hunter, R. J.: Agranulocytosis, M. Clin. North America **22:** 1669-1681 (Nov.) 1938.
32. Reznikoff, Paul: Acute Neutropenia (Granulocytopenia) (Agranulocytosis), New Internat. Clinics **3:** 106-129 (Sept.) 1939.
33. Kracke, R. R.: A Review of Granulocytopenia (Agranulocytosis), J. Lab. & Clin. Med. **17:** 993-1005 (July) 1932.
34. Brown, A. E., and Herrell, W. E.: Clinical Experience with Sulfamethylthiazole, Am. J. M. Sc. **200:** 618-632 (Nov.) 1940.
35. Applebaum, E.: Peripheral Neuritis Following Use of Sulfamethylthiazole in a Case of Subacute Bacterial Endocarditis, New York State J. Med. **41:** 1864-1865 (Sept. 15) 1941.
36. Garvin, C. F.: Peripheral Neuropathy and Toxic Psychosis with Convulsions Due to Sulfamethylthiazole, Am. J. M. Sc. **200:** 362-364 (Sept.) 1940.

and died. The postmortem examination of the brain revealed no abnormality. Another case of toxic psychosis with convulsions following sulfamethylthiazole therapy is reported by Roseman and Aring.[37] This psychosis appeared on the fifth day of a course of intensive sulfamethylthiazole therapy, and it terminated in death. There were petechial hemorrhages scattered throughout the gray matter, but the white matter was entirely spared, contrary to the usual findings in toxic hemorrhagic encephalopathy. The predominant lesion was the diapedetic hemorrhage. Some perivascular necrosis was present. The blood vessel changes were mostly endothelial. In this case there were the following complicating factors: (1) The tissues contained abnormal amounts of lead (patient had worked in a lead factory for many years but had never had any symptoms of lead poisoning); (2) The patient was alcoholic. Perhaps this case is an illustration of the deleterious effect of sulfamethylthiazole in the presence of preexisting central nervous system disease.

In case 6 peripheral neuritis developed after a course of sulfamethylthiazole therapy.

CASE 6.—A. R., a white woman aged 47, was admitted to the University Hospital on March 7, 1940. Ten weeks before admission cellulitis of the right side of the face developed. Later severe headache appeared. On admission physical examination showed slight blurring of the margins of the optic disks and a small retinal hemorrhage in the right eye. The blood count revealed leukocytosis and some hypochromic anemia. Two blood cultures showed Staphylococcus aureus and a diagnosis of staphylococcic septicemia was made. A neurologic examination on the fifth hospital day was negative except for a questionable mild sixth nerve paresis on the right and a subsiding papillitis. On the evening of the seventh hospital day the patient was given 4 Gm. of sulfamethylthiazole and thereafter for twelve days received 1.5 Gm. every four hours. There was moderate nausea and vomiting. After the drug was withdrawn, she continued to improve. A blood culture on the fourteenth hospital day showed no growth, and she was discharged on the thirty-third hospital day. Two days after discharge (sixteen days after sulfamethylthiazole had been discontinued), she noted sudden severe pain in both legs, some swelling of the dorsums of the feet and sudden foot drop, first on the right and then on the left. The pain in the legs improved gradually. One week later she vomited, lost consciousness and entered a local hospital for four days, but on discharge the foot drop was unimproved. One month after her previous discharge she was readmitted to the University Hospital complaining of pain above and behind the right eye. Examination showed that the previously diagnosed papillitis had subsided. There was also an area of localized cellulitis on the right wrist, but it was felt that it probably bore no relation to her previous illness. Neurologic examination disclosed a coarse tremor of the tongue, some atrophy of the small muscles of the hands (especially on the right), some weakness of the grip bilaterally and general weakness of the muscles about the hips, knees and ankles. There was almost complete loss of extension of the feet bilaterally, this being less noticeable on the right. There was mild weakness of the flexors of the feet. The upper tendon reflexes and the patellars were active and equal, but the achilles were absent bilaterally. There were no pathologic toe signs. The nerve trunks in both lower extremities were tender, and there was a patchy hypesthesia of both lower extremities, this change being most noticeable in the fifth lumbar and first sacral segments. Vibratory sensation was slightly impaired at the right ankle. Casts were made to prevent talipes equinous deformity, and the patient was discharged. She returned to the University Hospital one month later. In the interval she had taken 15 mg. of thiamine hydrochloride daily. There was no pain in the legs, but she had begun to notice some awkwardness in the use of her hands. There was hypesthesia over the second, third and fourth lumbar segments on the right; severe bilateral foot drop (worse on the left) was present, and the achilles reflexes were absent. Straight leg raising caused some pain on both sides, and there was slight pain on flexion of the neck. There was slight weakness of the grip, and mild atrophy was present in the first interosseous space bilaterally. The patient was seen again two months later, at which time there was some improvement in the foot drop, so that she could extend her toes and feet slightly when she was lying down. The numbness in the lower extremities annoyed her considerably, and examination disclosed hypesthesia and hypalgesia below the midthigh region on the right and below the knee on the left. Motion and position sense was absent in the feet. The knee jerks were moderately exaggerated, and the achilles reflexes were hyperactive and equal, but there were no pathologic toe signs. Four attempts to do a lumbar puncture were unsuccessful owing to the fact that the patient experienced extreme pain immediately after the needle passed through the dura, and it was felt that the needle was impinging on nerve trunks. Roentgenograms of the spine were negative. In spite of large quantities of thiamine hydrochloride, brewers' yeast and physical therapy, the patient showed little improvement during her stay in the hospital. She was not seen again after discharge.

In this case it is interesting to speculate as to the exact location of the lesion causing the foot drop and the sensory change. The achilles tendon reflexes were absent for a long time and then finally became hyperactive. The explanation for this is obscure, but it is possible that the peripheral neuritis subsided and unmasked symptoms due to involvement of the spinal cord itself.

SULFAGUANIDINE

As yet there is little evidence that sulfaguanidine is toxic to the nervous system. Perhaps this is because only relatively small amounts enter the blood stream.

SULFAPHENYLTHIAZOLE

Sulfaphenylthiazole is not used clinically. Bieter[7] found that it produces more injury to the nervous system than any of the other sulfonamides.

SULFADIAZINE

Sulfadiazine has only recently been introduced. It seems to have a wider range of therapeutic effectiveness than many of the others, perhaps owing to the fact that not so much of it is acetylated in the blood. With regard to its toxicity for the nervous system, Finland[38] treated 466 patients with this drug, and serious neurologic or psychiatric syndromes did not develop in any of his cases. Nausea and vomiting occurred in 9.2 per cent, and headache and dizziness were present in only 2 cases.

Recently a case of peripheral neuritis following sulfadiazine was observed, and it will be reported briefly:

CASE 7.—W. H. M, a white man aged 70, was admitted to the University Hospital complaining of nausea and vomiting. Subsequent studies showed that these complaints were due to uremia and acidosis secondary to benign prostatic hypertrophy with urinary obstruction. On admission the patient was quiet, oriented and cooperative. Physical examination was negative except for peripheral arteriosclerosis and pulmonary emphysema. Blood nonprotein nitrogen was 127 mg. per hundred

37. Roseman, E., and Aring, C. D.: Encephalopathy Associated with Sulfamethylthiazole Therapy, New England J. Med. **224**: 416-420 (March 6) 1941.

38. Finland, Maxwell; Strauss, Elias, and Peterson, O. L.: Sulfadiazine, J. A. M. A. **116**: 2641-2647 (June 14) 1941.

cubic centimeters and carbon dioxide combining power 31 volumes per cent. The urine was mildly infected, and he was given 3 Gm. of sulfadiazine daily from November 18 to December 7. He also received sodium lactate by mouth, and fluids were given in copious amounts. From November 26 to 29 an episode of confusion and hallucinosis occurred. During this time blood nonprotein nitrogen was 76.5 mg. per hundred cubic centimeters and carbon dioxide combining power 99 volumes per cent. It seems probable that alkalosis was at least partially responsible for this episode. From December 8 to 12 he received 1.5 Gm. of sulfadiazine daily. On December 10 a transurethral resection of the prostate was performed, and shortly after the operation the patient contracted bronchopneumonia. Sulfadiazine was increased to 4 Gm. daily and continued at this level until December 18. On the latter date the patient was having elevations of temperature without leukocytosis, and it was felt that the fever was probably due to the drug, so sulfadiazine was discontinued. The pneumonia had completely resolved by December 18, but postoperative hemorrhage had occurred and several blood transfusions were necessary to combat a severe hypochromic anemia. On December 18 and 19 he was again having hallucinations and was confused and disoriented. On December 20 a hemostasis was done, and his mental status improved gradually thereafter. On December 22 he had recovered enough to talk coherently, and on that day he first began to complain of numbness of the hands and feet. There was a hypalgesia in the ulnar distribution on the left, and also profound weakness of the grip was present on the same side. The numbness of the left hand persisted after he had been discharged on December 18, but the numbness of the right hand and of the feet subsided rapidly. He returned on March 17 for a check-up, and it was at that time that the first complete neurologic examination was done. His mental state was normal. He did not remember ever having had any pain associated with the numbness in the extremities. Vibratory appreciation was absent at the ankles and present at the wrists. There was hypesthesia and hyperalgesia in the distribution of the left ulnar nerve. The grip was moderately weak on the left, and there was severe paresis of the left adductor pollicis. Some atrophy was present in the first left interosseous space. There were no other sensory or motor abnormalities. The biceps, triceps, radial-periosteal, patellar and achilles reflexes were moderately active and equal.

COMMENT AND SUMMARY

Animal experiments seem to indicate that all members of the sulfonamide group have a toxic effect on the nervous system, the parent substance, sulfanilamide, being the least toxic, and some of the newer derivatives being the most toxic. The toxic effects are probably an integral part of the primary effect of the drugs on all cells, bacterial or human. It has been suggested [39] that some of the deleterious nervous and mental effects may be dependent on cerebral anoxia resulting from hemoglobin, attaching itself more readily to the sulfonamide group than to oxygen. Intermittent administration of a single sulfonamide or successive administration of different sulfonamides seems to predispose to the development of toxic nervous system symptoms, possibly through a sensitization process. A review of the clinical reports, in general, confirms the results of the animal experiments. The drugs appear more neurotoxic in the presence of preexisting disease of the nervous system. The following abnormal conditions have been reported as due to the use of the sulfonamides: dysmorphopsia, aphasia, agraphia, stammering, toxic psychosis, peripheral neuritis, encephalomyelitis, myelitis, optic neuritis, transitory myopia, meningeal signs, blindness and convulsions.

39. Schreiber, Frederic: Personal communication to the author.

SERIOUS COMPLICATIONS OF RUPTURED INTERVERTEBRAL DISKS

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Ruptured intervertebral disks are now known to be exceedingly common; they are, in fact, among the most frequent lesions treated surgically. Over 95 per cent of them are in the lumbar region, where they explain the overwhelming percentage of recurring pains low in the back plus sciatica in one or both legs. With rare exceptions it is now possible to diagnose and localize those in the lumbar region without spinal injections of iodized oil, air or other contrast medium or even without a lumbar puncture.[1] Up to the present time the course in all reported cases of ruptured disk except our first 2 has run true to form and there were no serious complications. Three serious sequelae encountered during the past month emphasize the potential dangers of this simple lesion when the diagnosis and treatment are delayed. One of the disks ruptured was in the cervical, another in the thoracic and the third in the lumbar region. The rupture of the cervical and the thoracic disk had disastrous results—total paralysis and death from pressure necrosis of the spinal cord in the former; in the latter the paralysis has partly cleared. The rupture of the lumbar disk caused permanent sensory paralysis in addition to long-continued pain and loss of bladder function with subsequent infection of the urinary system.

In addition to these 3 recent cases I have had 2 cases of ruptured disk (lumbar disk) with complete paraplegia (previously reported) and loss of bladder function and another (lumbar disk) with long-continued bladder incontinence and infection. These 6 cases of serious complications occurred in a series of perhaps 300 operative cases of ruptured disk, a percentage, therefore, of about 2. All the sequelae could have been prevented with early diagnosis and treatment. Although all the patients except the one with a cervical disk ruptured have survived, the paralysis of the patient with a thoracic disk ruptured will probably be permanent, and perhaps some permanent stigmas will affect the others, particularly those with infection of the urinary tract. Delay in treating a ruptured cervical or thoracic disk is disastrous because only a few hours is required to destroy the spinal cord irreparably. After paralysis due to a ruptured lumbar disk, function can be restored because the lesion involves the peripheral nerves. Moreover, spontaneous healing of a ruptured disk must be unusual.

REPORT OF CASES

CASE 1.—*Rupture of fourth lumbar intervertebral disk into spinal canal.*

A laboring man aged 53 had had a sudden severe attack of "sciatica" on the right side and pain low in the back five years before that kept him in bed over three months. The recovery was slow, covering a period of three months.

Thirteen months before, while he was shoveling sand, a pain (not very severe) stabbed him in the lower part of the back. As he continued at work the pain became intense and was increased by movement. Two days later, while he was at work, "something gave way in his back" and the pain became excruciating. He went to bed, and in the afternoon control of his bladder became difficult and then impossible. For

1. Dandy, W. E.: Concealed Ruptured Intervertebral Disks: A Plea for the Elimination of Contrast Mediums in Diagnosis, J. A. M. A. **117**: 821 (Sept. 6) 1941; Loose Cartilage from Intervertebral Disk Simulating Tumor of the Spinal Cord, Arch. Surg. **19**: 660 (Oct.) 1929.

four days he could not pass urine and was catheterized. The pain was unbearable, and he was unable to get out of bed; morphine was given repeatedly. On the fourth day the pain was somewhat improved; he was able to get up but could not use his right leg. The urine then began to dribble, but retention still made catheterization necessary. There was also fecal incontinence.

By degrees the pain lessened, but an infection of the bladder kept the patient in a hospital seventy-eight days. During this period he noticed numbness in the back of both legs, but the motor power in the right leg improved so that he could walk, although with difficulty. The disturbance and anesthesia of the bladder and rectum were still present when he was admitted to the Johns Hopkins Hospital one year later. The infection in the bladder had cleared despite continued intermittent use of the catheter.

Examination on Dec. 19, 1941 revealed (1) weakness of the flexor and extensor movements of the right foot, (2) bilateral anesthesia of all nerve segments on the right below the fourth lumbar vertebra, including (3) saddle anesthesia and (4) anesthesia of the penis and the scrotum, (5) loss of both achilles tendon reflexes and (6) only slight response of the rectal sphincter.

This patient was presented at ward rounds with the students, and an unequivocal diagnosis of ruptured intervertebral disk with compression of the lumbar spinal nerves was made; no

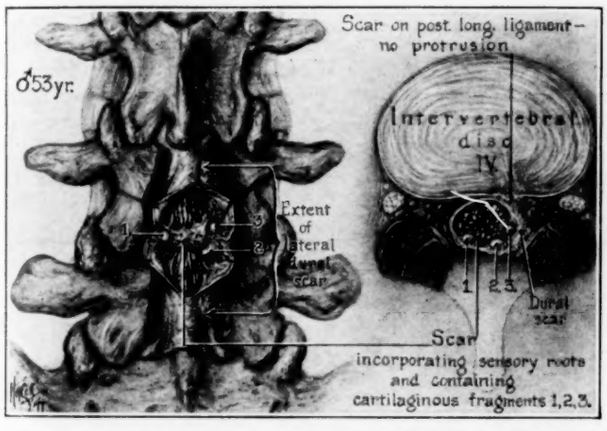

Fig. 1 (case 1).—Operative sketch showing intradural scar wrapped around the posterior roots of the cauda equina. Note the three little isolated fragments of intact cartilage (1, 2, 3). Sketch representing the cross section of the scar in the spinal canal.

other diagnosis could be considered. My assistant, Dr. Troland, whose diagnostic acumen is almost perfection, was gently chidded for having entertained the diagnosis of a tumor of the spinal cord and injected 1 cc. of iodized oil. This was our second spinal puncture and injection of iodized oil in 100 cases of ruptured intervertebral disk—a procedure that we have denounced for ruptured lumbar disks as unnecessary, misleading, painful and harmful. Roentgenograms with the iodized oil showed a complete block at the fourth lumbar disk.

We had assumed that the situation revealed at operation would be similar to that in other cases in which the protruding extradural disk was so large that the cauda equina had been compressed by the extradural mass. One exceptional objective observation, however, was noteworthy; i. e., the sensory loss was much greater than the motor, whereas the reverse would have been expected.

At operation (fig. 1) on the following day the usual unilateral approach was made. The fifth ligamentum flavum was reflected on a hinge and replaced when the subdural space was seen to be normal. Exploration of the fourth subflaval space immediately revealed a scar so dense that exposure beneath the dura was impossible. Removal of a notch in the upper part of the fifth lamina showed the same impenetrable scar. The only safe approach then was to expose the dura by a complete laminectomy. On the dorsal surface the dura became more normal and was opened. At the level of the fourth lumbar interspace a dense scar was encountered extending entirely across the spinal canal. The dura was then opened below the scar and the incision continued upward to it. The intradural scar was about 0.5 cm. wide and very dense and had two distinct components; there were three small pure white glistening nodules, each about 3 mm. in diameter, one far over to the left side of the dura on its dorsal aspect and the other two with a dumbbell formation on the right lateral aspect of the inner dura. These little white nodules were tightly bound together with the usual dense brownish red connective tissue of a scar. The mass clearly did not contain neoplastic elements. Three sensory nerve roots passed through the dense fibrous mass, and two had to be excised with it. Curiously this transverse fibrous mass was on the dorsal aspect of the spinal canal; the motor roots could be seen beneath and were intact after removal of the scar. On the right side the dura was an integral part of the scar and retained none of its normal appearance. The vertebral disk was then inspected. The posterior spinal ligament was a dense white scar but there was no localized protrusion, and when it was incised with a scalpel there was only very hard tissue beneath. The disk itself had, therefore, healed spontaneously after extrusion of the disk.

There could scarcely be a doubt that the scar throughout the interior of the spinal canal was the end product of the rupture of a disk into the spinal canal. And it was suspected that the small white glistening bodies in the scar represented actual remains of the extruded cartilage. In the stained microscopic sections cartilaginous remains were disclosed, some fairly normal and others so greatly disintegrated that only suggestions of cartilage were in evidence.

The patient left the hospital on Jan. 10, 1942, entirely relieved of pain and with some diminution in the anesthesia.

CASE 2.—*Rupture of sixth cervical disk with necrosis of spinal cord.*

A man aged 29 entered the hospital Jan. 2, 1942 and was operated on a few hours later. He was totally paralyzed in both legs and partly paralyzed in both arms and had bladder retention and loss of rectal control. Breathing was labored and was reinforced by use of the sternocleidomastoid muscles. There were rales in the lungs and much mucus which could not be delivered. The temperautre was 104.2 F., the leukocytes numbered 18,000 and a patch of pneumonia in the base of the right lung was suspected because of clinical signs and its presence confirmed by roentgenogram twenty-four hours later.

Forty-eight hours before the time of operation the patient was seemingly perfectly well in every way. While straining at stool he suddenly became paralyzed to the degree noted, and all sensation was lost below the neck. All this paralysis developed within a few seconds; it appeared to begin in the left foot, went to the right and passed upward like a flash. Thirty-six hours later the condition showed no improvement; the patient was then rushed by ambulance from a neighboring city.

Examination showed complete motor and sensory paralysis with a sharp sensory level at the sixth cervical segment. The patient was perfectly conscious but apprehensive and somewhat panicky because of the embarrassed respirations.

It was possible to obtain a history of pain in the neck and shoulder over a period of six or eight months, always intensified by throwing a ball or moving the neck. The pain had probably been somewhat less during the past month. I suspected an extradural or intradural encapsulated tumor (probably a meningioma) because of the past history of pain and the associated sudden paralysis following straining at stool. In a case reported several years ago[2] this sequence of events was regarded as pathognomonic of an encapsulated tumor, and it has since been found to be a trustworthy sign. A ruptured intervertebral disk was not suspected.

At operation with the patient under local anesthesia, a cervical laminectomy was performed. At the level of the sixth cervical vertebra a sharply defined lesion was encountered. For a distance of perhaps 2 cm. the cord was reddish brown, the vessels on the surface were enlarged and, for a moment, an aneurysm was considered. The cord was dis-

2. Dandy, W. E.: A Sign and Symptom of Spinal Cord Tumors, Arch. Neurol. & Psychiat. **16**: 435 (Oct.) 1926.

tinctly swollen; had iodized oil been injected (it was not) a block would probably have been shown. When the leptomeninges were stripped an area of pinhead size in the center looked almost transparent and was nicked with a knife; a large amount of the necrotic interior of the spinal cord oozed from the opening (fig. 2). The incision was extended almost the length of the lesion, and an increasing volume of necrotic material was spontaneously extruded. It contained no blood or fluid and was not even blood tinged; it was grayish white. It should be noted that a network of vessels extended up and down for some distance in the other layer of the arachnoid membrane, indicating a vascular support to the contiguous lesion in the cord. It is known that the white matter in the brain and spinal cord is much softer than the gray matter and, therefore, far more susceptible to trauma. It being evident, therefore, that this was a traumatic lesion, the cause was sought beneath the cord by gently retracting it. A rounded hard mass was seen bulging beneath the dura, which did not appear thickened or abnormal. An extradural search quickly revealed the protruding disk. When it was incised several pieces of cartilage extruded spontaneously; more were removed with forceps.

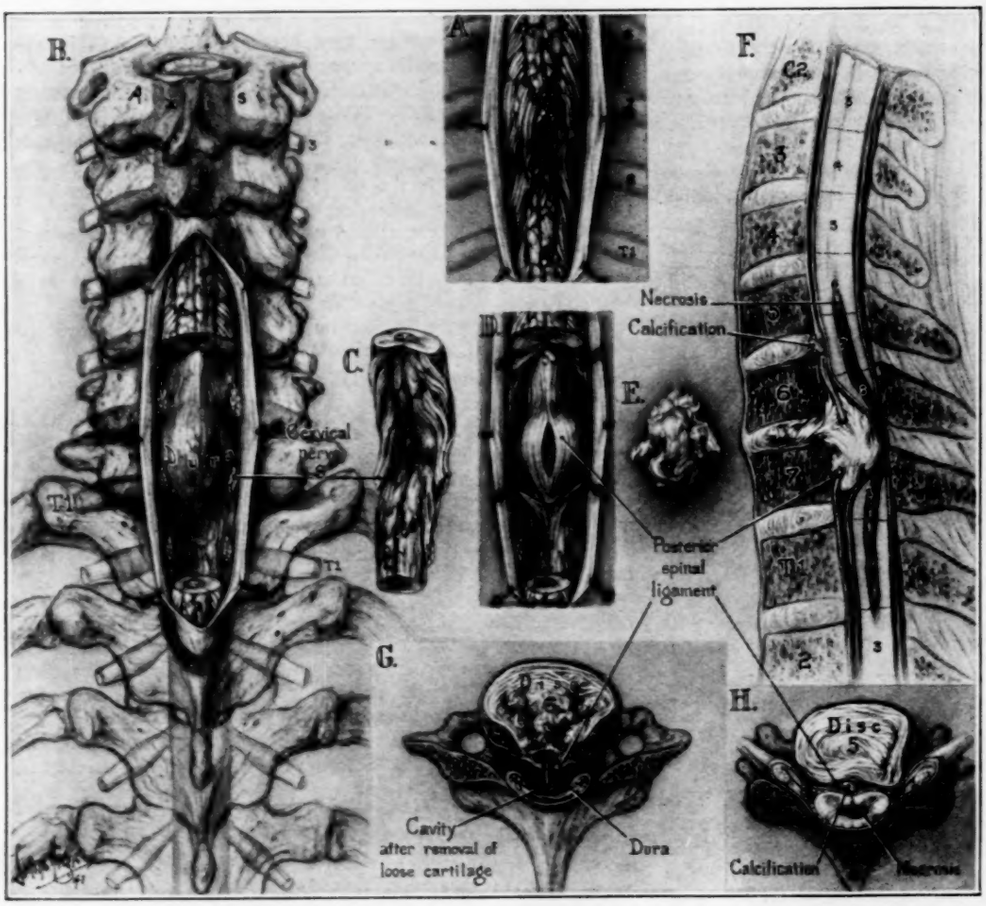

Fig. 2 (case 2).—*A*, the cord with the necrotic interior beginning to protrude at the surface. *B*, section of the cord removed to show the dura bulging because of rupture of the intervertebral disk. *C*, a drawing of the cord to show the effects of compression by the disk. *D* and *E*, cartilage removed from the bulging disk. *F*, diagram showing the effect of the lesion on the cord; note the extent of the necrosis of the interior of the cord. *G*, transverse section of the affected disk, showing the extent of the necrotic interior. *H*, cross section of a normal disk for comparison with the affected disk (*G*).

There appeared to be no possibility that return of function could follow so much necrosis of the interior of the cord. With administration of sulfathiazole the pneumonia cleared, but the patient died ten days later of paralysis of the respiratory tract. Examination of only the cervical portion of the cord and vertebrae was carried out.

CASE 3.—*Rupture of second thoracic disk with paraplegia.*

A Negro man aged 42 was admitted to the medical service Feb. 11, 1942 complaining of pain in the neck and inability to walk. The present illness had begun two months before with severe pains in the chest; a diagnosis of pneumonia had been made (probably erroneously). Five weeks before he had had a temperature of 103 F. During a stay of three weeks in another hospital the diagnosis of sinus infection was made. He was discharged, apparently well. Shortly thereafter there were some stiffness of the neck and some difficulty in bending forward. Two weeks before admission severe pains in the chest returned and radiated to both shoulders. Any movement intensified the pains, but they were not aggravated by coughing and sneezing. About the same time both legs became weak, and he could not walk. There were also urinary infrequency and dribbling. Within twenty-four hours the paralysis of the legs became almost complete. Examinations revealed (1) some pain on pressure over the first and second thoracic vertebrae, (2) almost total paralysis of both legs, (3) sharp sensory loss at the level of the third thoracic vertebra, (4) paralysis of the abdominal and the lower intercostal muscles, (5) extreme hyperactivity of the knee kicks and ankle jerks, (6) presence of the Babinski sign bilaterally, (7) loss of the position and the vibratory sense in the legs, (8) presence of the Queckenstedt sign (complete block), (9) a count of 50 cells (lymphocytes) in the spinal fluid, (10) a complete block at the second thoracic vertebra as shown with iodized oil (roentgenograms of the spine were normal) and (11) a temperature of 100 F.

The tentative diagnosis was epidural abscess or tubercle. A ruptured disk was not considered.

At operation on February 13, performed by Dr. Troland, rupture of the second thoracic vertebral disk was found. One large and many small pieces of cartilage were removed.

The paralysis was unimproved on March 11, 1942, but on May 1 there was decided improvement, the patient being able to take steps.

COMMENT

Among perhaps 300 operations for ruptured intervertebral disks these are the only instances of such complications, except our first 2 previously reported cases, and none, I think, have been reported in the literature. Although these complications are relatively uncommon, the quick succession of these 3 cases indicates that they are probably to be expected more frequently in the future.

Spontaneous resolution of ruptured intervertebral disks has been suspected from the history of patients whose signs and symptoms appeared to indicate clearly the existence of a ruptured disk and later disappeared. The usual history is one of recurrent attacks with intervals varying up to several months or years. However, it is my belief that a spontaneous cure is infrequent and occurs only after a period of many years. In case 1 the

lesion in the disk had remained dormant for four years and then had sprung up anew from the effects of the trauma incident to heavy lifting. This is the common story. I have suspected but cannot prove that a permanent cure results only when the protruding cartilage actually ruptures through the posterior ligament, where it is gradually absorbed. The reason for such a conception is the course of events after operation. It is now known that the important part of operative treatment is the adequate opening of the retaining posterior spinal ligament, which permits the eventual extrusion of the defective cartilaginous content of both the disk and the protrusion. The actual removal of a cartilaginous sequestrum doubtless hastens the healing and cure, but rarely, if ever, can all the defective disk be removed, and frequently, particularly if the disk is concealed, few or none of the fragments are removable without the inducing of an inadvisable degree of trauma. An adequate opening of the ligamentous cover is, therefore, the indicated treatment. This is probably the reason that ruptured disks are not found after severe crushing injuries of the spine or soon after dislocation; i. e., the posterior spinal ligament is torn and permits the injured disk to extrude spontaneously.

The high percentage of permanent cures which follow operation and are without sequelae therefore suggests that the extruded cartilage eventually is absorbed and disappears. Only twice have I seen at operation actual spontaneous rupture of the posterior spinal ligament with freely lying cartilage in the extradural space. I suspected that had operation not intervened a spontaneous cure might have resulted, but it is probable that the trauma (bending the spine) incident to lifting the patient to the operating table may have induced the rupture; in both instances the rupture through the spinal ligament could not long have antedated the operation. In case 1 the acute pressure of the protruded disk eroded the overlying dura and permitted its penetration into the spinal canal—an unusual sequel and almost a cure. Had the protrusion remained extradural a cure would probably have resulted. The long preservation of cartilage in the spinal canal and its incorporation in the scar indicate the disposition of an autogenous graft of cartilage in this situation.

In case 2 a successful result with restoration of spinal functions could not have been possible after the lapse of much time—probably a few hours. Once necrosis of the interior of the cord had begun the loss of function could only be rapidly progressive and permanent. The optimum time for the diagnosis and treatment, therefore, was before the spinal cord had been compressed with such abrupt suddenness. It is true that at the time of operation rupture of a vertebral disk was not suspected, but had the patient been seen earlier and an opportunity of study been provided it would probably have been suspected. Rupture of a cervical disk is far less common than rupture of a lumbar disk (in 10 of our 300 cases the ruptured disk has been in the cervical region), but it is sufficiently frequent to be considered seriously when a patient complains of pain in the neck—especially in the lower part of the neck—the shoulders and the arms. In all our cases the rupture has been at the sixth or the seventh cervical disk.

A postmortem examination in case 2 revealed only the cortical shell of the spinal cord remaining at the level of the rupture. When held to the light it was transparent for a distance of about 2 cm. A large cavity extended up and down the center of the spinal cord from the top of the fifth cervical vertebra to the top of the second thoracic—a distance of four vertebrae! This cavity was due to the extension of the necrosed spinal cord along the path of least resistance: extrusion through the meningeal covering is the more resistant course. The ruptured disk, as large as a hickory nut, pushed the dura posteriorly and in the exact midline. The entire center of the disk was loose cartilage, about one third of the entire disk being grossly destroyed. The area of necrosis extended through the anteroposterior extent of the disk; a seemingly normal cushion remained on each side. The lateral position of so many disks had prepared us to believe that the nucleus pulposus has nothing to do with the development of a ruptured disk. This specimen, however, which I believe is the only one reported post mortem, suggests that the destruction of cartilage did and probably always does begin in the nucleus pulposus. The greater frequency of lateral protrusions doubtless is explained by the looser attachment of the posterior spinal ligament to the vertebral body on the sides than in the center. Moreover, the ligament is definitely thicker in the middle. The much tighter binding of the ligament in the center is easily and strikingly demonstrated by stripping it with forceps. Eventually, however, the pressure beneath the ligament may become great enough to force the central attachment also, as in this case.

CONCLUSIONS

1. Though not frequent (occurring in 6 of 300 cases, an incidence of 2 per cent), serious sequelae resulting from rupture of an intervertebral disk produce severe loss of function referable to the spinal cord or the cauda equina (depending on their site).

2. A ruptured disk in the cervical or the thoracic region is a potential source of permanent destruction of the spinal cord. Its diagnosis and treatment before involvement of the spinal cord is of permanent importance. The diagnosis is suggested by localized and referred pain. After the spinal cord is involved operative treatment within a few hours is imperative if any function referable to the spinal cord is to be expected. Iodized oil is indicated for an early diagnosis when the spinal cord is involved, i. e. when the ruptured disk is in the cervical or the thoracic region. It is not indicated for rupture of a lumbar disk because with rare exceptions the diagnosis can be made with much more accuracy and certainty without it.

Old Age and Change of Habits.—The mental hygiene of old age is often a crucial factor. Lucky is he who possesses that asset invaluable in senility, a cheerful disposition. The aged must endeavor by every means to curb emotion, promote equanimity and maintain contact with the outside world. Nature checks the emotional life, but this recession must be turned to advantage and not give way to indifference and selfishness. The ability to keep young requires training and exercise; it is the duty of those around the old to support their morale, to encourage their self respect and to convince them that they are loved and useful. As old trees cannot stand transplantation, so old people find it arduous to weather changes of habit and routine. The growing rigidity and unadaptability of the regulatory mechanism produce an automatism in senility which reacts with distinctly deleterious effects to the death of the marital partner, change of residence, retirement or other environmental modifications. Since this progressive automatism is inevitable and irreparable, it is advisable, as far as possible, to avoid habit deviations in senescence unless the change is specifically indicated or unavoidable.—Mueller-Deham, Albert, and Rabson, S. Milton: Internal Medicine in Old Age, Baltimore, Williams & Wilkins Company, 1942.

SUBACUTE BACTERIAL ENDOCARDITIS DUE TO STREPTOCOCCUS VIRIDANS

A SURVEY OF THE PRESENT STATUS OF THE PREVIOUSLY REPORTED CURES AND A CLINICAL STUDY OF FIFTEEN TREATED CASES, INCLUDING ANOTHER CURE

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Previous to the advent of the sulfonamide drugs recovery from Streptococcus viridans subacute bacterial endocarditis was exceedingly rare (table 1). The incidence of spontaneous cure, averaging all reported group studies, is 1 per cent.[1] Libman's series [2] of 150 patients with 3 per cent spontaneous recovery is the most favorable report. Lichtman and Bierman [1] have recently compiled the serial studies of six workers comprising a total of 634 patients. There were six spontaneous recoveries in this group. All patients in these groups were studied before the sulfonamide era.

TABLE 1.—*Recovery Rates in Subacute Bacterial Endocarditis with Different Forms of Therapy (from All Medical Literature)* *

	Number of Cases	Recoveries	
		Number	Percentage
1. Nonspecific treatment or spontaneous recovery	634	6	1
2. Chemotherapy alone	198	12	6
3. Chemotherapy with heparin	43	5	11.5
4. Chemotherapy and hyperthermia	25	4	16
5. Chemotherapy and intravenous typhoid	21	4	20

* Only group studies are included in this table. Isolated reports of cases in which recovery occurred are omitted because the percentage of recovery could not be estimated.

Interest in the treatment of this almost universally fatal disease and enthusiasm over the newer therapeutic procedures with the sulfonamides have given rise to many reports in the literature in recent months.

In the earlier part of the sulfonamide era (1936 to 1939) chemotherapy was used without such adjuncts as heparin, neoarsphenamine and hyperpyrexia. During this period, 198 patients were treated by eleven groups of workers with twelve recoveries, an average of 6 per cent (table 1).

In 1939 Kelson and White [3] first advocated the use of heparin with the sulfonamides. Since this time 43 cases treated by this method have been reported by three groups of workers [1] with a recovery rate of 11.5 per cent. More recent reports, however, are less favorable.[4] Heparin is both expensive and dangerous, and the advantage of using it in the treatment of subacute bacterial endocarditis does not at the present time seem to outweigh its disadvantages.

In 1939 H. J. White [5] demonstrated an increase of one hundred fold in the bactericidal properties of sulfanilamide with an increase in the temperature from 37 C. to 39 C. (99.2 F. to 102.2 F.). Occasionally, before and since this observation attempts have been made to treat subacute bacterial endocarditis with hyperpyrexia and the sulfonamides. Lichtman and Bierman [1] have collected the reports of 25 cases from three clinics in which hyperthermia induced by diathermy and the sulfonamides were given. The recovery rate in this small group was 16 per cent (4 cases).

The sulfonamides with artificial fever induced by intravenous typhoid-paratyphoid injections have been used by Solomon [6] and others. Of 21 patients treated by this method, 4 have recovered, a recovery rate of 20 per cent, the highest of any reported group.

A follow-up study of the cases in which recovery has occurred after subacute bacterial endocarditis due to Streptococcus viridans that have been reported in the medical literature since the advent of the sulfonamides has been attempted. Letters were sent to thirteen authors, who have reported a total of 35 cases in which recovery occurred. Answers were received from all. The results will be chronologically considered.

In 1938 there was 1 recovery reported.[7] The patient suffered cardiac failure and died a few months later. Autopsy showed complete healing of the recent endocarditis.

In 1939 12 recoveries were reported.[8] The periods of observation of these cases ranged from twenty-five to thirty-six months. Only 1 of these 12 patients is dead. This patient died of congestive heart failure six months after the subacute bacterial endocarditis had been clinically cured; autopsy revealed complete healing of the endocarditis.

In 1940 there were 10 instances of recovery added to the literature.[9] Nine of these patients are living and well today with observation periods ranging from one to three years. One of these patients was observed only three and one-half months after apparent cure and no follow-up is available.

In 1941 there has so far been reported (some not yet published) 12 recoveries.[10] The period of observation in this group of patients varies from eight months to three years, and all are living and well except 1. This patient was killed in an automobile accident five months

From the medical service of the Piedmont and Emory University hospitals.

The following physicians sent the authors follow-up notes and other personal communications: Drs. Ralph Major, Wesley Spink, Perrin Long, Paul D. White, Kurt Lippmann, Jacob Heyman, Amos Christie, William Bierman, Harry Solomon, Howard Heyer, Samuel A. Levine, Sam Gibson, Robert Gross and Arthur Merrill.

1. Lichtman, S. S., and Bierman, William: The Treatment of Subacute Bacterial Endocarditis, J. A. M. A. **116:** 286 (Jan. 25) 1941.

2. Libman, Emanuel: A Further Report on Recovery and Recurrence in Subacute Bacterial Endocarditis, Tr. A. Am. Physicians **48:** 44, 1933.

3. Kelson, S. R., and White, P. D.: A New Method of Treatment of Subacute Bacterial Endocarditis, J. A. M. A. **113:** 1700 (Nov. 4) 1939.

4. Leach, E. C.; Faulkner, J. M.; Duncan, C. N.; McGinn, Sylvester; Porter, R. R., and White, P. D.: Chemotherapy and Heparin in Subacute Bacterial Endocarditis. J. A. M. A. **117:** 1345 (Oct. 18) 1941.

5. White, H. J.: The Relationship Between Temperature and the Streptococcidal Activity of Sulfanilamide and Sulfapyridine in Vitro, J. Bact. **38:** 549 (Nov.) 1939.

6. Solomon, H. A.: Subacute Bacterial Endocarditis: Treatment with Sulfapyridine and Intravenous Injections of Typhoid-Paratyphoid Vaccine, New York State M. J. **41:** 45 (Jan.) 1941.

7. Major, R. H., and Leger, L. H.: Recovery from Subacute Infectious Endocarditis Following Prontosil Therapy, J. A. M. A. **111:** 1919 (Nov. 19) 1938.

8. Major, R. H., and Leger, L. H.: Recovery from Infectious Endocarditis, J. Kansas M. Soc. **40:** 324 (Aug.) 1939. Spink, W. W., and Crago, F. H.: Evaluation of Sulfanilamide in the Treatment of Patients with Subacute Bacterial Endocarditis, Arch. Int. Med. **64:** 228 (Aug.) 1939. Long and Bliss.[15]

9. Lippmann, Kurt: Subacute Bacterial Endocarditis (Case): New Method of Treatment, New York State M. J. **40:** 524 (April) 1940. Heyman, Jacob: Subacute Bacterial Endocarditis Successfully Treated with Sulfanilamide, J. A. M. A. **114:** 2373 (June 15) 1940. Christie, Amos: Subacute Bacterial Endocarditis Apparently Cured with Sulfanilamide, J. A. M. A. **115:** 1357 (Oct. 19) 1940. Bierman, William, and Baehr, George: The Use of Physically Induced Pyrexia and Chemotherapy in the Treatment of Subacute Bacterial Endocarditis, J. A. M. A. **116:** 292 (Jan. 25) 1941.

10. Heyer, H. E., and Hick, F. K.: Experiences in the Treatment of Subacute Bacterial Endocarditis with Sulfanilamide, Sulfapyridine and Sulfathiazole; A Review of Previously Reported Cured Cases with the Report of Fifteen Treated Cases Including One Cure and One Aborted Case, Ann. Int. Med. **15:** 291 (Aug.) 1941. Gibson, Sam: Personal communication to the authors. Merrill, Arthur: Personal communication to the authors. Druckman, J. S.: A Case of Subacute Bacterial Endocarditis with Apparent Cure, J. A. M. A. **117:** 101 (July 12) 1941. Solomon.[6] Gross.[11]

after surgical ligation of the patent ductus arteriosus. Postmortem examination showed the ductus to be completely closed and no vegetations could be found.

Of the 12 reported cures for 1941, 4 resulted from surgical ligation of an infected patent ductus arteriosus.[11] Sulfonamide therapy was used in conjunction with the surgical procedures. Observation on these 4 patients was from eight months to twelve months.

A CLINICAL STUDY OF FIFTEEN PATIENTS WITH SUBACUTE BACTERIAL ENDOCARDITIS

Fifteen cases of subacute bacterial endocarditis due to Streptococcus viridans were studied. This group comprises all such cases from Piedmont Hospital (12 cases) and Emory University Hospital (3 cases) in which sulfonamide therapy has been given up to the present time, Nov. 1, 1941.

The usual drug reactions were encountered. Lack of clinical and cultural response, together with drug intolerance, accounts for the periods of omission in therapy and the variety of chemotherapeutic agents employed. Transfusions were carried out in all as a supportive measure, 1 patient receiving a total of forty-five during his nine months of illness terminating in death. Large amounts of vitamins and iron were given as indicated. In 1 patient neoarsphenamine was used with sulfathiazole and a persistent, severe, peripheral neuritis developed. Heparin, maintaining a clotting time of one hour, had been previously used for 1 patient who suffered a cerebral embolus during that period. Three other patients not on heparin experienced major embolic phenomena: radial, pulmonary and popliteal. All 15 had minor episodes. The spleen was palpable in only 7 cases.

TABLE 2.—*Authentic Recovery from Subacute Bacterial Endocarditis (Streptococcus Viridans) Since Advent of Sulfonamides with Follow-Up Through November 1941 (Compiled from the Literature and Personal Communications)*

Date	Author	Number of Patients	Associated Cardiac Lesion	Therapy	Time of Observation to November 1941
1938	Major and Leger	1	Rheumatic heart disease with mitral and aortic insufficiency	Azosulfamide and sulfanilamide	29 days and died from congestive heart failure; autopsy showed healed endocarditis
1939	Major and Leger	1	Rheumatic heart disease with mitral stenosis	Azosulfamide and sulfapyridine	3 years
1939	Spink and Crago	1	Patent ductus arteriosus	Sulfanilamide	3 years, well and 3 months pregnant at that time
1939	Long	7 (7 of 117 patients)	4 congenital heart 1 rheumatic mitral 2 unspecified	Sulfanilamide	All living and well in the spring of 1941
1939	Kelson and Paul White	3	1 unspecified 1 rheumatic heart with mitral systolic murmur 1 aortic insufficiency	Sulfapyridine and heparin	1, 28 months 1, 6 months and died of congestive heart failure; autopsy showed healed valvulitis 1, 26 months
1940	Leach, Faulkner, Duncan, McGinn, Porter, White, Kelson	3 (6 of 61 patients)	1 mitral stenosis and aortic insufficiency 1 rheumatic heart with mitral insufficiency 1 patent duct	Sulfapyridine and heparin or sulfapyridine and sulfathiazole	1, over 12 months 1, over 12 months 1, killed in auto accident; autopsy showed healed valvulitis
1940	Lippmann	1	Rheumatic heart disease (?)	Sulfanilamide, azosulfamide, sulfapyridine and arsenic	3½ months; patient left town and not heard of thereafter
1940	Heyman	1	Patent ductus arteriosus	Sulfanilamide	Over 2 years, living and well
1940	Major	1	Rheumatic heart disease (?)	Sulfapyridine	Over 19 months
1940	Christie	2	Rheumatic heart disease with congenital heart disease	Sulfanilamide	1, over 2 years, living and well 1, over 1 year, living and well
1940	Bierman and Baehr	2	1 apical systolic murmur 2 unspecified	Sulfanilamide and hyperpyrexia	1, over 2 years 1, over 1 year
1941	Solomon	4	1 mitral stenosis 1 mitral stenosis and aortic insufficiency 2 aortic insufficiency	Sulfanilamide or sulfapyridine with intravenous typhoid paratyphoid vaccine	1, over 2 years 1, over 1 year 1, over 1 years 1, over 1 year
1941	Heyer and Hick	1	Coarctation of aorta	Sulfanilamide	3 years, living and well
1941	Gibson and S. A. Levine	1	Unspecified	Sulfanilamide, sulfathiazole and hyperpyrexia	8 months
1941	Smith, Sauls and Stone	1	Patent ductus arteriosus	Sulfanilamide	19 months
1941	Gross	3	Patent ductus arteriosus	Sulfanilamide, surgical ligation of patent duct	1, 3 months 1, over 12 months 1, killed by accident 5 months after operation
1941	Merrill and Elkin	1	Patent ductus arteriosus	Sulfonamides, surgical ligation of patent duct	5½ months after ligation
1941	Druckman	1	Mitral stenosis	Sulfapyridine, sulfamethylthiazole, heparin, neoarsphenamine	18 months

GENERAL OBSERVATIONS

The average age was 41 years with the youngest patient being a girl of 16 years and the oldest being a man of 71. In general, the younger patients tolerated the chemotherapeutic agents much better than the older group. Sulfadiazine seemed the most acceptable sulfonamide to the older patients.

The average interval between the onset of symptoms and the institution of chemotherapy in this group of 15 was twenty-four days, with the shortest period seven days and the longest eight months. A frequent initial chief complaint of the patient was that he had the "flu." An acute respiratory infection coincided with the prodromal symptoms of 3 patients. Two patients insisted that they were well until they underwent a tooth extraction, and 1 first noticed a gingivitis six days before systemic symptoms became manifest. Another patient

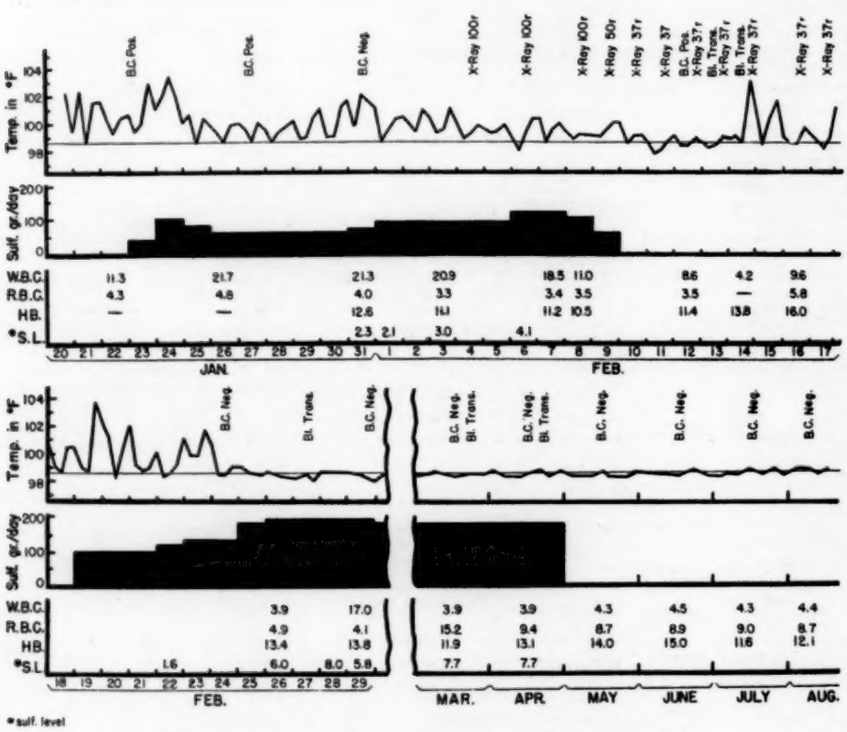
11. Gross, R. E.: Surgical Closure of the Patent Ductus Arteriosus, Modern Concepts of Cardiovascular Disease, No. 12, **10**: 6 (Nov.) 1941. Merrill, Arthur, and Elkin, Dan: Personal communication to the authors.

was subjected to intradermal allergy tests the day of onset. The remaining 9 patients offered no clue as to the possible port of entry for the infection.

RESULTS

Of these 15 patients, 10 were dead on an average of six and seven-tenths months after the first symptom, the shortest interval being two months and the longest interval twelve months. Eight of these 10 patients came to autopsy. Underlying rheumatic damage was found in 5 of these 8 patients, congenital pulmonary stenosis in 1, only arteriosclerotic changes in another and infection superimposed on an old syphilitic aortic valvulitis in another. This last finding is quite rare, only 4 similar infections with Streptococcus viridans having been previously reported.[12]

All postmortem examinations revealed splenic and renal infarcts except in 1 case. This patient had an infection superimposed on a congenitally stenotic pulmonary artery, and embolic phenomena were limited to the lesser circulation.



Hospital record of patient with subacute bacterial endocarditis.

Five patients remain alive, 3 with evident persistent disease and 2 without. Each of the 3 patients with persistent symptoms have rheumatic heart disease. Two of these patients received "adequate" therapy with sulfathiazole, sulfapyridine and sulfadiazine. Details are lacking in the third but the prognosis in all is equally unfavorable.

Two of the 15 are living and apparently well. In each of these the streptococcic infection was superimposed on a patent ductus arteriosus. In 1 the ductus was ligated successfully by Dr. Dan Elkin on June 16, 1941, and the patient remained well four and one-half months after discontinuance of chemotherapy (to be reported in detail at a later date by Drs. Arthur Merrill and Dan Elkin). The other patient with apparent cure has had no surgery and remained well nineteen months after discontinuing drug treatment. Details of this case follow:

REPORT OF CASE IN WHICH RECOVERY OCCURRED

A girl aged 16 years with an asymptomatic patent ductus arteriosus had been under observation since she was 10. A check-up was made at yearly intervals and there had been no evidence of progressing myocardial disease during this time.

One month before the onset of the present illness the patient was seen because of the sudden development of a raised black "mole" on her right thigh. This was removed by wide surgical excision (Dr. Perrin Nicholson) on Dec. 16, 1939. The pathologic report on this specimen was hemangioma. Recovery was uneventful.

The patient was next seen on Jan. 17, 1940, one month later, at home. At this time there was an influenza epidemic in the community. She presented the clinical picture of fever, aching and a negative physical examination other than the previously noted signs of a patent ductus arteriosus. During the first five days, fever was intermittent, the temperature ranging from 99 to 104 F. At this time a small petechia was found in the left lumbar region. A blood culture made on this day was positive within twenty-four hours for Streptococcus viridans. A second blood culture five days later was positive within forty-eight hours for the same organism.

The patient was well developed and well nourished. There were no other petechial manifestations and the only abnormal physical finding was a continuous machinery murmur with a systolic thrill over the second and third left intercostal space. There was no cardiac hypertrophy except a prominent pulmonary conus. The lungs were clear throughout, and the spleen was not palpable.

Previous electrocardiographic studies were normal and teleroentgenograms showed only a prominent pulmonary conus. A complete blood count was normal except for 11,300 white cells on January 22 and 21,700 white cells on January 26. The differential blood studies were normal. Urinalyses were negative except for occasional red blood cells in the sediment. Blood cultures were positive on four occasions for Streptococcus viridans.

One week after the onset of the present illness sulfanilamide was begun. She received on successive days 40 grains (2.6 Gm.), 100 grains (6.5 Gm.) and 80 grains (5.2 Gm.); then 60 grains (4 Gm.) daily for six days. Fever persisted, but at a lower level. On January 31, two weeks after the onset of the present illness, the patient was admitted to the hospital. Intravenous sulfanilamide 15 grains (1 Gm.) every twelve hours was given in addition to 15 grains by mouth every six hours. Blood sulfanilamide concentration on this dose reached 4.1 mg. and there was an appreciable reduction in the temperature curve. By the eighteenth day of continuous treatment a secondary anemia developed, and sulfanilamide was discontinued for eight days. During this time two transfusions were given and high voltage roentgen therapy in eleven treatments of 535 roentgens over the second and third left intercostal spaces was given.

Blood cultures taken during sulfanilamide therapy on January 31 and February 3 had become negative, but three days after cessation of the sulfanilamide (February 12) the blood culture again was positive for Streptococcus viridans.

12. Braunstein, A. L., and Townsend, S. R.: Bacterial Endocarditis on Superimposed Syphilitic Aortic Valvulitis, Arch. Int. Med. **65**: 957 (May) 1940.

Two transfusions restored the red blood cell count to 5,840,000, and sulfanilamide therapy was resumed on February 19. The dose was started at 100 grains by mouth in twenty-four hours. This was gradually increased to 190 grains (12 Gm.) daily, and the blood concentration ranged between 5 and 9.1 mg. per hundred cubic centimeters. Eight days after beginning this dosage of sulfanilamide the patient became afebrile, and the blood cultures again were negative.

On March 1, after one month's stay in the hospital, she was given a transfusion for the third time and allowed to go home. There sulfanilamide therapy was continued, 180 grains (11.6 Gm.) daily for the next two months. During this two month interval blood counts, blood cultures, blood sulfanilamide levels and urinalyses were done once of twice each week. She remained afebrile. Two other transfusions were given during the two months, but in general the drug was tolerated without difficulty and the patient complained bitterly of "not being drunk any more" after the drug was completely withdrawn on May 1. A total of 894 Gm. was given during this period of seventy-three days of continuous therapy.

Since May 1 she has received no chemotherapy, and repeated blood cultures have been negative. Twenty-nine months have now elapsed since the last positive blood culture, and today (May 15, 1942) she is clinically well. There has been no detectable change in the heart murmur, heart size or contour or in the electrocardiograms when compared with those recorded before the onset of the subacute bacterial endocarditis.

During the past year she has enjoyed a normal high school existence and has gained 16 pounds (7.3 Kg.). In February 1941 she contracted whooping cough, but the severe coughing paroxysms of several weeks' duration did not precipitate a reinfection of the healed endocarditis.

The patient's excellent clinical response to sulfanilamide therapy was probably due to its early administration and to the long-continued administration of large doses. The drug was able to exert its bactericidal effect on the organisms before the "fibrin-platelet mass" formed a protective coating over the colonies.

COMMENT

As has been pointed out by Christian,[13] a most important factor in the treatment of these patients with the sulfonamides is early diagnosis. It has been shown[14] that the bacterial colonies have thrown about themselves a fibrin-platelet protectorate that is practically impervious to the sulfonamides. If this protective wall has had sufficient time to become thick enough to prevent access of the drug to the bacteria, cure is obviously almost impossible. In our case the clinical manifestations of the disease were not of over one week's duration before sulfanilamide therapy was begun.

A second factor of importance is the maintenance of a high blood concentration of the drug. A 10 mg. concentration of the blood stream has been arbitrarily determined the optimum level.[15] This requires a variable dosage of the drug, as individual absorption and clearance may be different. In our case, 180 grains of sulfanilamide daily was required to maintain a satisfactory blood concentration.

Intolerance to the drug is a disturbing factor complained of by many patients. This is eliminated largely now by the more easily tolerated sulfadiazine. Even with this relatively pleasant drug such idiosyncrasies as blood dyscrasias and renal complications may occur.

In evaluating the therapeutic effect of the sulfonamides, it must be remembered that sulfapyridine may exert an antipyretic effect[16] and in this way lower the temperature without appreciably decreasing the infection. False therapeutic optimism may arise from this phenomenon. Likewise, blood cultures may fail to show bacterial growth after the sulfonamides have been given, even though infection is still present. This error may be avoided by adding para-aminobenzoic acid to the culture mediums to neutralize the bactericidal effect of the sulfonamide present in the blood specimen being cultured.[17]

At this time, it seems that a combination of sulfapyridine or sulfadiazine therapy, protein shock and artificially induced fever with intravenous typhoid-paratyphoid vaccine offers the most favorable therapeutic approach to this disease.

Solomon[18] is now administering typhoid-paratyphoid vaccine in 1,000 cc. of isotonic solution of sodium chloride and 5 per cent dextrose either slowly or rapidly, depending on the height and the duration of the fever desired. The intravenous typhoid therapy is begun on the night of the second day after sulfapyridine therapy has been instituted. Two Gm. is given for the first two doses and then 1 Gm. thereafter at four hour intervals. One-half minim (0.03 cc.) of the typhoid vaccine is given in the saline-dextrose solution, and this dose is repeated in one to two hours, if necessary to maintain the temperature level above 104 F. for at least three hours continuously. The injections are continued nightly several hours after the last meal for seven to ten days. The amount of the vaccine is increased as necessary to maintain the desired level of temperature. Sulfapyridine is usually continued for at least one week after vaccine therapy has been discontinued.

Accessory therapeutic measures such as fluids, adequate nourishment, vitamins, sedatives and transfusions are carried out in addition to specific therapy. Examinations of the blood and urine are performed at frequent intervals in order to ascertain the drug level in the blood and to detect evidences of drug intoxication.

CONCLUSIONS

1. There has been a gradually decreasing mortality rate in subacute bacterial endocarditis since the advent of the sulfonamides.

2. The literature has been searched for authentic instances of cure of subacute bacterial endocarditis due to Streptococcus viridans and 35 reports were found. The authors of these reports were written to and follow-up notes to date have been obtained.

3. The clinical records of 15 patients treated by several physicians at the Piedmont Hospital and Emory University Hospital which have been tabulated show that there were 2 patients who recovered in this group.

4. Various therapeutic procedures have been used in combination with the sulfonamides including heparin, neoarsphenamine, hyperpyrexia by diathermy, and hyperthermia with typhoid-paratyphoid vaccine. The

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14. Friedman, Meyer: Use of Sulfanilamide and Sulfapyridine in the Therapy of Subacute Bacterial Endocarditis, Arch. Int. Med. **67:** 921 (May) 1941. Duncan, C. N., and Faulkner, J. A.: Penetration of the Blood Clot by Sulfanilamide, Sulfapyridine, Sulfathiazole and Sulfamethylthiazole, Am. J. M. Sc. **200:** 492 (Oct.) 1940.

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16. Beeson, P. B., and Janeway, C. A.: The Antipyretic Action of Sulfapyridine, Am. J. M. Sc. **200:** 632 (Nov.) 1940.

17. Janeway, C. A.: Method for Obtaining Rapid Bacterial Growth in Cultures from Patients Under Treatment with Sulfonamides, J. A. M. A. **116:** 941 (March 8) 1941.

18. Solomon, H. A.: Personal communication to the authors.

latter is most recent and in a small series of cases has afforded the best recovery rate. Because of increased tolerance without decreased efficiency, sulfadiazine with intravenous typhoid is probably the method of choice at the present time and should receive extensive clinical trial.

5. Clinical trial on larger groups of patients with the combined use of sulfadiazine and the intravenous use of typhoid-paratyphoid vaccine should be carried out. This method has so far offered the best recovery rate, but the number of patients treated in this manner is too small to justify final conclusion at this time.

6. Surgical ligation must be considered for those patients having patent ductus arteriosus associated with subacute bacterial endocarditis.

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LUMBAR PUNCTURE

ITS POTENTIAL ROLE IN THE PRODUCTION OF INJURIES TO THE INTERVERTEBRAL DISK

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The use of lumbar puncture in the investigation of lesions of the central nervous system has become so standardized that it is almost as much of a routine procedure as the systematic study of the reflexes. The saying that "familiarity breeds contempt" may be aptly applied to this procedure, for one seldom considers that there is any real danger associated with its use. Many thousands of punctures have been done by the staff of the department of neurosurgery in the Boston City Hospital during the past ten years and, as far as is known, the occurrence of headache during the ensuing one to three days has constituted their only complication. It may be well, however, at this point to emphasize that the presence of space-occupying lesions within the cranial cavity, as suggested either by the history or by the physical findings including an examination of the optic disks, constitutes a definite contraindication to its use.

During recent years the role of herniation of the nucleus pulposus in the pathogenesis of low back and recurrent pain in the sciatic distribution has been confirmed by many investigators. The fact that even small injuries to the annulus fibrosus may produce a hiatus through which the plastic nucleus pulposus can herniate has led us to reevaluate lumbar puncture as a possible etiologic agent in the production of this entity.

The intervertebral disk is composed of two distinct parts, namely the annulus fibrosus and the nucleus pulposus. The annulus fibrosus is a fibrous tissue structure derived from mesenchymal cells that migrate from the sclerotomes to surround the notochord at about the fifth week of embryologic development. The notochord, which at first is continuous throughout the length of the developing vertebral column, becomes segmented by about the second month. The expanding segments are either squeezed or migrate into the area occupied by the anlage of the developing intervertebral disk, which at this stage consists of mesenchymal cells previously mentioned. The segments gradually lose their connection with one another, though remnants of this original connecting structure may persist. If they do persist they form a point of weakness which leads in later years to herniation of the nucleus into the body of the vertebra as described by Schmorl.[1] The further evolution of the mesenchymal cells leads to the development of a strong fibrous membrane, which is attached to the margins of the bodies of adjacent vertebrae and internally is intimately fused with the nucleus pulposus, for which it acts as a limiting membrane.

The intervertebral disks constitute one fourth of the entire length of the vertebral column. The mobility of the spinal column as regards flexion, extension and rotation is dependent on the plasticity of this structure. The extremes of movement are limited by the length of the spinal ligaments. It is at once apparent that flexion of the spine will simultaneously relax the anterior spinal ligaments and put the posterior ligaments on a stretch. The anterior portion of the annulus fibrosus will also be relaxed and the posterior section stretched to the same relative degree as the respective spinal ligaments. The fluidity of the nucleus pulposus serves to cushion the alterations in the pressure developed between the vertebrae in all these movements, while the annulus fibrosus acts as its limiting membrane. Any injury to the membrane, whether resulting from excessive stretching or from direct penetration, can be expected to weaken its limiting power and thus permit the plastic nucleus to protrude beyond the limits of the borders of the vertebral bodies. Anteriorly or laterally, such an occurrence will cause few recognizable or significant symptoms. If the nucleus is extruded posteriorly, however, because of the vertebral canal there will be encroachment on and subsequent distortion of the spinal nerve roots, particularly as they enter the intervertebral foramens, and the symptoms will be both significant and common. The greatest strain on the posterior ligaments will be found at the fourth and fifth lumbar and first sacral vertebrae where the lumbar curve is centered. It is at this point that clinically recognizable herniations of the nucleus pulposus most frequently occur.

It is unnecessary for our purpose to enter into a description of the further details of the anatomy and pathology of lesions of the intervertebral disk, as an excellent description of these features may be found in the recent monograph of Bradford and Spurling.[2] The experimental work of Barr [3] demonstrated that he could repeatedly distend the annulus fibrosus by compressing the intervertebral disk. There was always a return to normal subsequent to the release of the pressure except when the annulus fibrosus had been pierced by a needle, in which case herniation of the nucleus pulposus occurred. The same conditions present in his study are associated with the performance of a lumbar puncture. The flexion of the spine, which is the usual position of the patient during the operation,

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stretches the posterior portion of the annulus fibrosus and produces an associated increase in the tension of the nucleus, while the lumbar puncture needle supplies the penetrating force.

The occurrence of injury to the annulus and nucleus by the spinal needle has been reported by several writers. In 1919 Levinson [4] noted that material from the disk might block the needle during puncture. Billington [5] studied 35 cases of back pain in which the clinical and radiologic evidence pointed to damage of the intervertebral disk by lumbar punctures done during the course of meningitis. Twelve cases showing clinical evidence of protrusion of the nucleus following lumbar puncture were reported by Pease.[6] The symptoms were characteristic, and the interval between the puncture and the onset of symptoms was less than two weeks. Other cases have appeared in the literature, but those cited will suffice as a representative summary and to indicate that the inherent danger has long been recognized even though neglected.

In 1938 one of us [7] described a method of doing lumbar punctures in which it was advocated that flexion of the spine of the patient be abandoned. It was pointed out that such a position was of no actual aid in securing more room for the needle between the adjoining bones and indeed militated against easy puncture. This was because of the adverse physiologic condition engendered in a conscious patient who was held immobile and helpless while a strange and possibly painful procedure that he could not see was being carried out. The x-ray evidence to be adduced offers additional and equally important reasons for abandoning the custom of approximating the patient's neck and knees as a prerequisite to lumbar puncture or as a substitute for the patient's cooperation.

During the past year a two needle technic of myelography has been developed in the neurosurgical department of the Boston City Hospital. In the course of this procedure the spinal needles are permitted to remain in situ while the lateral spine plates are exposed. This has given us an opportunity to study such needles when in position in the subarachnoid space as regards their direction toward the intervertebral spaces. The punctures have all been done by members of the staff of the department. We have studied a consecutive series of roentgenograms containing fifty needles with the following results: Thirty-six per cent of the needles were in such a position that had they been inserted farther in the line of their course they would have penetrated the annulus fibrosus. The distance between the end of the needle and the surface of the annulus averaged between 4 and 5 mm. We explain the depth of the penetration of the needle beyond the anterior dura by a pushing of the arachnoid ahead of the point of the needle. This appears to be a factor which cannot be altered at present. One puncture was made between the eleventh and twelfth dorsal vertebrae. This needle was found directed away from the intervertebral space. Eleven needles were inserted between the last dorsal and the first lumbar vertebra. In three instances the needle was directed toward the disk. In one of these the needle was only 2 mm. from the surface of the annulus fibrosus. Eight needles were placed between the first and second lumbar vertebrae. Six were found directed in such a way that their projection would not have involved the intervertebral space. The three needles between the second and third lumbar vertebrae were all directed toward the bony wall of the body of the bone. The space between the third and fourth vertebrae appeared to be the most dangerous one in this series. Twelve needles were in this space. Nine, or 75 per cent, were found directed toward the intervertebral space. Seven needles were inserted between the fourth and fifth lumbar spines. The projection of the axis of three, or 42 per cent, of these was directed toward the annulus fibrosus. The two latter sets of figures are of particular importance in view of the fact that it is through these two spaces that the majority of lumbar punctures are done in clinical practice. The use of the interspace between the last lumbar and the first sacral vertebra appears from this study to be the safest one because only one of the eight needles photographed in this position was directed toward the dangerous area.

Position of needles.

Our findings demonstrate that perforating injury to the posterior part of the annulus fibrosus is a distinct possibility during the course of lumbar punctures done without forced flexion of the spine and by men who are familiar with the procedure. The depth to which the needles have penetrated emphasizes the care that must be taken if perforation of the annulus fibrosus is to be avoided.

The series is too small to be statistically significant but suggests that the interspace between the last lumbar and the first sacral vertebra is the location of choice, and that the spaces between the third and fourth and the fourth and fifth lumbar vertebrae should be avoided whenever possible. We do not wish to imply that this form of injury is a frequent or major cause of herniation of the intervertebral disk but rather that it constitutes a mechanical possibility the danger of which must always be kept in mind.

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THE BLOOD CONCENTRATION AND URINARY EXCRETION OF SULFADIAZINE

FOLLOWING INTRAPERITONEAL ADMINISTRATION

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Since sulfadiazine has been shown, on oral and intravenous administration, to possess certain advantages over the other sulfonamide drugs (it is readily absorbed, is excreted comparatively slowly, is acetylated in blood and urine to a lesser degree, causes fewer toxic manifestations and is effective against a wider variety of pathogenic bacteria),[1] it seemed to us that this would be the drug of choice for intraperitoneal use in abdominal surgery. Although studies on the intraperitoneal use of sulfanilamide have been reported by a number of investigators,[2] we have been unable to find reports of the intraperitoneal use of sulfadiazine. We have studied the blood levels and urinary excretions of sulfadiazine following the intraperitoneal administration of the drug to determine the rate of absorption and hence the depletion of the local intraperitoneal store, since the advantages of this route of administration are dependent on the local concentration of the drug.

MATERIALS AND METHODS

Six adult male patients were used in this study. The age, clinical diagnosis and operative procedures for each patient are shown in the accompanying table. At operation doses of sulfadiazine powder varying from 5 to 25 Gm., as indicated in the table, were sprinkled into the peritoneal cavity. On returning from the operating room each patient was catheterized and the catheter allowed to remain in the bladder. All urines were collected, the volumes measured and samples taken for analysis at various intervals following the intraperitoneal administration of the drug. At similar intervals samples of blood were taken from the median cubital vein and placed in bottles containing sodium oxalate. Following the initial intraperitoneal dose there was no further administration of any sulfonamide by any route. The sulfadiazine concentration in the blood and urine samples was determined by the method of Bratton and Marshall.[3] The fluid intake during the period of study was noted.

Dr. Benjamin Carey of Lederle Laboratories, Inc., furnished the sulfadiazine used in this study.

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RESULTS

The results are shown in the accompanying table. In the patient who received the 5 Gm. dose of sulfadiazine, the free blood sulfadiazine concentration thirteen hours after the administration of the drug was 2.2 mg., the total 2.6 mg. per hundred cubic centimeters; at thirty-four hours the free blood sulfadiazine concentration was 2.6 mg., the total 2.8 mg. per hundred cubic centimeters, and at sixty hours the free blood sulfadiazine concentration was 1.3 mg., the total 1.3 mg. per hundred cubic centimeters. The urinary excretion was not determined on this patient. In the 3 cases in which 10 Gm. of sulfadiazine was given intraperitoneally the peak of the blood sulfadiazine level occurred at twelve hours in case 3 and case 4 and at twenty-four hours in case 2. The highest level obtained was 5.6 mg. per hundred cubic centimeters for free sulfadiazine and 6.1 mg. for total sulfadiazine (case 2). The lowest peak occurred in

Blood Concentration and Urinary Excretion of Sulfadiazine Following Intraperitoneal Administration in Six Cases

Case	Dose of Sulfadiazine, Gm.	Hours After Administration	Blood Sulfadiazine, Mg. per 100 Cc.		Urine Sulfadiazine, Mg. per 100 Cc.		Urine Volume, Cc. per 6 Hrs.	Fluid Intake, Cc. per 6 Hrs.
			Free	Total	Free	Total		
1. Age 20; acute appendicitis; appendectomy	5	12	2.2	2.6	...	...	...	...
		36	2.6	2.8	...	...	...	...
		60	1.3	1.3	...	...	...	...
2. Age 70; carcinoma of stomach; partial gastrectomy	10	6	2.3	3.5	51	93	175	625
		12	4.5	4.8	87	109	175	625
		18	5.0	5.7	221	332	185	625
		24	5.6	6.0	236	350	150	625
		30	...	6.0	159	281	200	750
		36	...	6.1	104	280	25	750
		42	5.2	5.8	211	304	200	750
		48	3.0	3.7	161	200	55	750
		54	2.0	3.5	142	192	210	750
		60	2.5	2.8	125	168	185	750
		72	2.3	2.5	130	170	120	750
3. Age 57; carcinoma of stomach; partial gastrectomy	10	6	3.4	3.9	37	108	275	750
		12	5.0	5.4	160	234	225	750
		18	4.2	4.5	384	493	120	750
		30	4.8	4.5	159	162	330	750
		36	3.5	4.5	...	...	295	750
		48	2.9	3.7	71	92	...	750
		54	1.9	1.9	73	79	240	750
		66	1.6	1.6	47	58	...	750
		72	1.5	1.5	...	...	...	...
4. Age 55; carcinoma of stomach; exploratory laparotomy	10	6	3.4	3.8	35	40	150	1,000
		12	4.5	4.7	278	324	65	1,000
		18	3.7	4.3	292	365	50	1,000
		24	3.1	3.5	379	463	125	1,000
		36	1.5	1.6	...	...	...	825
		42	...	...	79	96	300	825
		48	1.6	3.0	50	64	250	825
		54	1.3	1.6	45	85	480	825
		60	...	...	82	106	200	825
		66	1.0	1.1	60	83	180	...
		78	Trace	Trace	52	88	300	...
5. Age 40; duodenal ulcer; partial gastrectomy	20	6	8.0	10.0	17	24	240	1,000
		12	14.0	14.7	60	93	225	1,000
		24	....	....	849	963	100	1,000
		30	18.5	20.7	324	608	150	1,000
		36	18.0	19.9	254	417	200	750
		42	15.3	17.5	332	609	175	750
		48	13.9	14.3	301	531	125	750
		54	8.3	8.4	264	392	250	750
		60	...	...	493	579	200	825
		66	6.6	6.9	...	...	...	825
		78	4.8	5.4	...	...	...	825
		84	3.2	3.2	276	361	250	825
6. Age 50; duodenal ulcer; partial gastrectomy	25	3	3.7	3.8	10	11	270	1,000
		6	7.3	7.3	86	93	75	1,000
		12	8.5	8.8	1,123	1,327	300	1,000
		18	9.1	10.4	1,537	2,086	400	1,000
		24	9.6	9.6	449	671	300	825
		30	5.5	5.8	...	...	...	825
		36	7.3	7.8	768	793	250	825
		42	6.1	6.4	730	745	250	825
		48	5.1	5.8	723	829	250	825
		54	3.9	4.1	766	936	175	825
		60	...	...	476	514	300	825
		66	3,5	3.7	201	234	...	825
		72	3.1	3.9	218	260	...	825
		96	3.2	3.2	62	79	...	...

case 4, in which the free blood sulfadiazine was 4.5 mg. per hundred cubic centimeters and the total 4.7 mg. The blood levels remained elevated in case 2 and case 3 for forty-eight hours and in case 4 for twenty-four hours. Detectable amounts were present in all cases for at least three days following the administration of the drug. In all cases the concentration of the drug in the urine paralleled the blood concentration, the greatest excretion occurring between twelve and twenty-four hours after the administration of the drug. The acetylated sulfadiazine in the urine rarely exceeded 30 per cent of the total urine sulfadiazine in all cases. In case 2, approximately 30 per cent of the drug was excreted in forty-eight hours and 40 per cent in seventy-two hours. The total fluid intake was relatively constant in all cases, the amounts for each six hour period being indicated in the table. The volume of urine excreted varied somewhat in each case, as can be seen from the table, but the daily output was comparatively constant.

In the patient who received 20 Gm. of sulfadiazine intraperitoneally, the blood sulfadiazine concentration reached its peak twenty-eight hours after the administration of the drug, the free sulfadiazine being 18.5 mg. per hundred cubic centimeters and the total 20.7 mg. This level was maintained for fourteen hours, after which time it began to drop relatively slowly and at ninety-four hours the blood level was still elevated, the free blood sulfadiazine concentration being 3.2 mg. per hundred cubic centimeters and the total 3.2 mg. There were detectable amounts of the drug present in the blood one week after it was administered. The concentration of sulfadiazine in the urine again paralleled that in the blood, the greatest excretion of the drug occurring between twenty-four and forty-eight hours after its administration. Again the acetylated fraction in the urine rarely exceeded 30 per cent of the total drug. The fluid intake was constant, as can be seen from the table. The volume of urine excreted showed some variation in each six hour specimen, but again the twenty-four hour output was relatively constant.

Following the administration of 25 Gm. of sulfadiazine intraperitoneally in case 6 the blood sulfadiazine

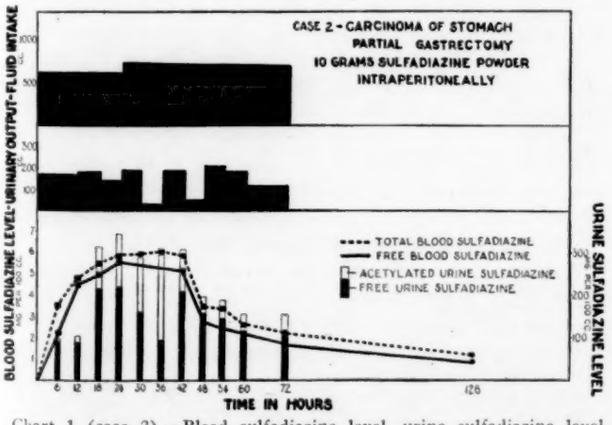

Chart 1 (case 2).—Blood sulfadiazine level, urine sulfadiazine level, Urinary output and fluid intake in a patient with carcinoma of the stomach with partial gastrectomy; 10 Gm. of sulfadiazine powder was given intraperitoneally.

concentration rose steadily until at eighteen hours the free sulfadiazine concentration was 9.1 mg. per hundred cubic centimeters and the total 10.4 mg. This level was maintained for approximately twelve hours and then began to fall, and at ninety-six hours the concentration of both free and total sulfadiazine in the blood was 3.2 mg. per hundred cubic centimeters. Here again the concentration of the drug in the urine paralleled that in the blood, the greatest excretion occurring between twelve and thirty-six hours after the administration of the drug. Exceedingly large amounts of the drug were excreted in the urine during the first sixty hours, as can be seen from the table. Twenty hours after the administration of the drug the total urine sulfadiazine was 2,086 mg. per hundred cubic centimeters and the free 1,537

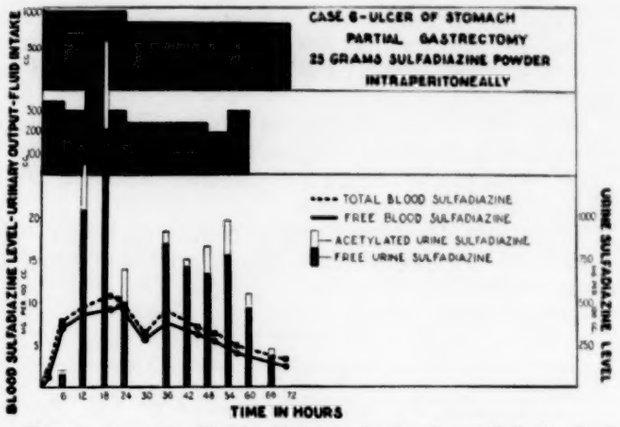

Chart 2 (case 6).—Blood sulfadiazine level, urine sulfadiazine level, urinary output and fluid intake in a patient with ulcer of the stomach with partial gastrectomy; 25 Gm. of sulfadiazine powder was given intraperitoneally.

mg. No sulfadiazine crystals were seen in this specimen. The volume of urine excreted again showed slight variation but was fairly constant over the twenty-four hour period. The fluid intake was maintained with slight variations.

COMMENT

The concentration of sulfadiazine in the blood following the intraperitoneal administration of the drug rises fairly rapidly and remains elevated for a considerable period of time, depending on the amount of the drug administered. With the administration of 10 Gm. of the drug effective levels persist for approximately forty-eight hours, with 20 to 25 Gm. for seventy-two to ninety-six hours. Thus one need not administer the drug by any other route for two to four days postoperatively and, in addition, one can be fairly certain that the local concentration of the drug in the peritoneal cavity remains high for the same period of time. Although we have observed no ill effects following the administration of the larger doses of the drug (20 to 25 Gm.), it would appear that the administration of 10 Gm. is satisfactory for the maintenance of adequate blood levels and high local concentrations in comparatively clean operative cases such as we have studied. In cases of gross contamination of the peritoneal cavity with widespread peritonitis one need not fear giving larger doses.

It can be seen from our results that sulfadiazine powder is readily absorbed from the peritoneum, although not as rapidly as from the gastrointestinal tract. Sadusk and Tredway [4] have shown that the peak of absorption of sulfadiazine given by mouth occurs between three and six hours. The peak of absorption in our cases occurred somewhat later, between twelve and thirty-six hours. The slower absorption of the drug from the peritoneum is to be desired so that the local concentration will remain elevated for a longer period of time. Keeley,[5] injecting a solution of sulfanilamide into the peritoneal cavity of dogs, obtained a peak

4. Sadusk, J. F., Jr., and Tredway, J. B.: Observations on the Absorption, Excretion, Diffusion and Acetylation of Sulfadiazine in Man, Yale J. Biol. & Med. **13**: 539, 1941.

5. Keeley, J. L.: Intraperitoneal Administration of Sulfanilamide; Concentration in Peripheral Blood in Dogs, Proc. Soc. Exper. Biol. & Med. **46**: 458, 1941.

of absorption in two to six hours. Jackson and Coller,[6] using powdered sulfanilamide intraperitoneally, obtained the peak of absorption within four hours. Since the absorption of sulfadiazine from the peritoneal cavity is slower than that of sulfanilamide, we feel that it is the better drug to use for local intraperitoneal implantation.

SUMMARY

Blood and urinary concentrations of sulfadiazine were studied in six cases after the intraperitoneal administration of doses of sulfadiazine powder ranging from 5 to 25 Gm.

With 10 Gm. of sulfadiazine intraperitoneally effective blood levels of the drug were maintained for forty-eight hours, with 20 Gm. for eighty-four hours and with 25 Gm. for ninety-six hours.

There were no postoperative complications and no toxic manifestations of the drug observed in any of the cases studied.

477 First Avenue.

WESTERN EQUINE ENCEPHALOMYELITIS OCCURRING SPORADICALLY IN A METROPOLITAN AREA

REPORT OF CASE

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All previously observed and properly diagnosed cases of the western form of equine encephalomyelitis in man have been encountered only in rural or semirural districts, usually in conjunction with large or small epidemics, in areas in which there were or had been epizootics of the disease in horses. The case herein reported presents a unique exception to this epidemiologic rule in that the patient dwelt in the heart of an industrial area of a large city and had not been away from this environment for many years. No other cases of the disease are known to have occurred in the region.

H. A., a painter aged 49, unmarried, living in Chicago, was admitted to the Albert Merritt Billings Hospital on Aug. 24, 1941. He had been well and working until three days before his admission, when he noticed pain in the back of the head and neck. During the next two days he had diarrhea with frequent watery stools. The day before admission he had malaise and felt chilly. The following day he was feverish and his physician found his temperature to be 105 F. The diarrhea had ceased at this time. He did not have a sore throat or other symptoms of an infection of the upper respiratory tract.

On admission the pharynx was injected and there was a slight enlargement of the cervical lymph nodes. A rough systolic murmur was heard over the aortic area, less distinctly at the base. There was some diffuse abdominal tenderness. He was slightly drowsy and listless but there were no other neurologic signs and no evidence of meningeal irritation. The admission temperature was 105 F., the pulse rate 100 and the respiratory rate 24. The white blood cells numbered 15,000, 50 per cent of which were polymorphonuclear leukocytes and 45 per cent lymphocytes. The urinalysis was normal except for a few granular casts and white blood cells. Nose and throat cultures were not abnormal and there was no growth on repeated blood cultures. Roentgenograms of the chest showed clear lung fields. Agglutination tests against the usual pathogenic intestinal organisms were negative. The Wassermann and Kahn reactions of the blood were negative.

The temperature ranged between 103 and 105 F. for the first three days, 102 and 104 F. on the fourth and fifth days and then slowly fell to normal by the sixteenth day of hospitalization. On August 27, the third hospital day, the clouding of the sensorium had increased; there was some mental confusion and a slight but definite stiff neck. The spinal fluid, examined for the first time, was under a pressure of 140 mm. There were 180 cells, almost all of which were lymphocytes. There was a faint trace of globulin, the Wassermann reaction was negative and the colloidal gold curve was 0011110000. The total protein was 49 mg. per hundred cubic centimeters and the sugar 83 mg.

On August 28 a neurologic examination revealed distinct mental clouding and disorientation. Responses to simple questions were not intelligible and he followed directions poorly and incompletely if at all. There was moderate rigidity of the neck and the Kernig sign was elicited on both sides. The optic fundi were hyperemic but there was no papilledema. There were no cranial nerve palsies and no selective weakness of the extremities, nor was there any gross incoordination of movements so far as could be determined. The activity of the tendon reflexes was variable, but all were present and equal on the two sides. Plantar and abdominal reflexes were normal. There were no obvious sensory disturbances. Continual restless plucking movements of the fingers of both hands were observed and there was a coarse, irregular tremor during voluntary movements of either arm. There was a plastic type of resistance to passive movements of the shoulder, elbow, hip and knee joints, greatest in flexor groups and more severe on the left side. At times there was a cogwheel quality to this rigidity.

This state of affairs represented the greatest development of signs and symptoms. Within a few days the sensorium began to clear and in this respect he appeared normal by the fifteenth day. It was then noted that his face was somewhat expressionless. The rigidity of the arms and legs and the tremor of the upper extremities improved slowly and steadily but was still obvious at the time of his discharge from the hospital fifty-six days after the onset of his illness.

He was seen for the last time on November 4, when he felt very well. A slight jerky resistance to passive movements was still present at the right shoulder, elbow and hip and a fine irregular tremor persisted in the outstretched hands, more on the right side.

The results of a series of examinations of the spinal fluid are given in table 1.

TABLE 1.—*Results of Examinations of the Spinal Fluid*

Date	Pressure, Mm.	Cells	Protein, Mg./100 Cc.	Sugar, Mg./100 Cc.
8/27/41	140	180	49	83
8/29/41	...	130	..	77
9/ 3/41	160	60	53	89
10/ 3/41	120	36	42	74

TABLE 2.—*Western Equine Encephalomyelitis*

Equal parts of 1:125 suspension of virus (guinea pig brain) and serum incubated two hours at 37 C.; 0.3 cc. inoculated intracerebrally into a guinea pig.

Serum of patient plus virus	No elevation of temperature; no symptoms up to 6 weeks
Control: normal serum and virus	Temperature elevated to 105.4 F.; prostration; death on 5th day

Repeated questioning elicited the information that the patient had not been out of the city of Chicago since 1924 and had not even been for a drive in the country during the entire summer of 1941. He had been employed continuously as a painter of Pullman cars from December 1940 until the onset of his illness. During the summer of 1941 these cars were brought in from service all over the country. Most of the cars had been used for the transport of troops. They were cleaned and stripped before being painted. He did not remember ever having seen mosquitoes in the cars or of having been

6. Jackson, H. C., and Coller, F. A.: The Use of Sulfanilamide in the Peritoneum, J. A. M. A. **118**: 194 (Jan. 17) 1942.

From the Department of Medicine of the University of Chicago. Aided by a grant from the Morton D. Hull Fund for Medical Research.

bitten by one while working. No one in his family had been sick during the summer. No animals were kept in the house in which he lived.

Two guinea pigs were inoculated intraperitoneally with 10 cc. of freshly drawn spinal fluid taken on the eighth and the thirteenth day of the disease and two groups of 4 mice each were inoculated intraperitoneally with 0.25 cc.

TABLE 3.—*St. Louis Encephalitis*

Serum, 0.2 cc., and virus suspension, 0.1 cc., incubated 2 hours at 37 C.; 0.03 cc. inoculated intracerebrally into groups of 4 mice each.

	Mouse Deaths on Days										
Day.....	1	2	3	4	5	6	7	8	9	10	Comment
Serum patient virus 1:3,000.....	..	..	..	2	2	..	..	..	..	..	No protection
Serum patient virus 1:20,000.....	..	..	..	1	2	1	..	..	..	..	No protection
Serum patient virus 1:100,000.....	..	..	..	..	1	3	..	..	..	..	No protection
Normal control serum virus 1:3,000..	..	..	..	2	2	..	..	..	..	..	No protection
Normal control serum virus 1:20,000.	..	..	..	2	2	..	..	..	..	..	No protection
Normal control serum virus 1:100,000	..	..	..	..	4	..	..	..	..	..	No protection

and intracerebrally with 0.03 cc. of the same material. In none of these animals did significant symptoms develop.

The blood of the patient taken on the fourteenth day of the disease was tested for neutralizing substances against the virus of western equine encephalomyelitis. Blood taken in the sixth week after the onset of the illness was tested for protection against the viruses of St. Louis encephalitis and lymphocytic choriomeningitis. Strong neutralizing antibodies were found against western equine encephalomyelitis virus but there was no protection against St. Louis encephalitis or lymphocytic choriomeningitis, as indicated in tables 2, 3 and 4.

These results were checked and corroborated through the courtesy of Dr. F. Howell Wright, who, using mouse protection tests, found that the patient's serum protected against more than 100,000 intraperitoneal minimum lethal doses and more than 10 intracerebral minimum lethal doses of western equine encephalomyelitis virus but did not protect against either the eastern equine encephalomyelitis or St. Louis encephalitis viruses.

COMMENT

The interest and the significance of the observations depend on the validity of the specific diagnosis. The seasonal incidence of this case of acute encephalitis, its symptoms and signs, the spinal fluid changes and the course of the disease are all consistent with what is known of the clinical picture of western equine encephalomyelitis in man. The question arises whether or not it is permissible to make an etiologic diagnosis of the disease based on the positive results of the immunologic tests. It is my opinion that such a diagnosis is entirely justified for the following reasons:

It will be agreed that the only possible explanations for the presence of strong specific protection against the western equine encephalomyelitis virus in the blood of this patient are either that the present illness was due to this virus or that he had suffered a previous inapparent infection with the virus which had left him with neutralizing antibodies against it unrelated to the present disease. The large amounts of antiviral substances present and their early appearance in the blood of the patient are in accord with the known facts of active infection of animals and man with both the eastern and the western variety of the equine encephalomyelitis virus. No extensive or systematic studies of the incidence of protective substances in the blood of random samples of the populations in nonepidemic areas or of asymptomatic contacts in epidemic areas such as have been made with reference to the St. Louis encephalitis and lymphocytic choriomeningitis viruses are as yet available for the equine encephalomyelitis virus. What information does exist on this point indicates that positive neutralization tests against the virus are found only in persons who have had the disease. Thus Fothergill [1] examined the serums of 58 familial contacts of patients with the disease and found them all negative. He concludes that "subclinical infection in man with the equine virus, except possibly under epidemic conditions, must be very uncommon." In this connection I can state that I have examined the serums of 11 other patients with acute encephalitis of unknown etiology in the Chicago area together with the serums of 12 random normal controls for neutralizing antibodies to western equine encephalomyelitis and have found no evidence of protective antibodies in any instance. Two of these cases of encephalitis occurred in the summer of 1941. However, it appears that subclinical infections of this kind resulting in the presence of specific antibodies in the blood can occur under exceptional circumstances. Olitsky and Morgan [2] have reported strong neutralization against eastern equine encephalomyelitis in the blood of a laboratory worker who had been exposed to the virus for a period of six years without having symptoms of the disease develop. Five other workers also exposed to this virus showed no protection. It should be noted that the subject of this report was singularly free from any suspicion of exposure to the virus for many years prior to his illness.

In the light of the now established epidemiology of equine encephalomyelitis the implications of this case are twofold. It is possible that a reservoir of the virus has been established in the fauna of a large city and has been transmitted by a local insect vector, in which case further urban outbreaks or epidemics may be anticipated. What seems more likely is that this patient was infected by an insect vector transported from an epidemic area in a common carrier (Pullman car).

TABLE 4.—*Lymphocytic Choriomeningitis*

Equal parts of serum and virus suspension incubated two hours at 37 C. and three hours at room temperature; 0.5 cc. inoculated into guinea pigs, subcutaneously.

	Guinea Pig Deaths on Days														
Days.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Comment
Serum patient virus 1:100	..	..	..	..	..	..	..	..	1	..	..	..	..	..	No protection
Serum patient virus 1:1,000	..	..	..	..	..	..	..	1	..	..	..	..	..	..	No protection
Serum patient virus 1:10,000	..	..	..	..	..	..	..	..	..	..	1	..	..	..	No protection
Normal control serum virus 1:100	..	..	..	..	..	..	..	1	..	..	..	..	..	..	No protection
Normal control serum virus 1:1,000	..	..	..	..	..	..	..	1	..	..	..	..	..	..	No protection
Normal control serum virus 1:10,000	..	..	..	..	..	..	..	..	1	..	..	..	..	..	No protection

1. Fothergill, L. S.: Virus and Rickettsial Diseases: Harvard Symposium, Cambridge, Mass., Harvard University Press, 1940.
2. Olitsky, P. K., and Morgan, I. M.: Protective Antibodies Against Equine Encephalomyelitis Virus in the Serum of Laboratory Workers, Proc. Soc. Exper. Biol. & Med. **41**: 212 (May) 1939.

THE RENAISSANCE OF PROSTATECTOMY

WITH PARTICULAR REFERENCE TO MINIMAL HOSPITALIZATION, WITHOUT PRELIMINARY DRAINAGE

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During the latter half of the past decade, certain definite and well recognized factors have resulted in changes almost revolutionary in character in the conception of prostatic surgery. These changes involve a complete remodeling of both professional and lay points of view with respect to operative indications, operative hazards, operative technic, functional results and, particularly, the necessity for preoperative drainage. I propose to enumerate and discuss briefly the causes of these fundamental changes and to explain and justify the apparent heresy which the title of this article implies.

On many occasions in the past I have expressed myself unequivocally with respect to the vital necessity of preprostatectomy drainage. Certainly until recently this has been the essence of successful prostatic surgery and the one factor of paramount importance responsible for the dramatic lowering of the prostatectomy mortality rate from above 40 per cent to below 3 per cent and for the conspicuous minimizing of the prostatectomy hazard to the end that the risk of this procedure in the aged and debilitated has come to compare favorably with that of appendectomy in the young and robust.

Exemplifying opinions expressed in the past, I cite the following: "As known by every one (but ignored by many), the answer to the uremia question is preoperative drainage, by retention catheter or via the suprapubic route, for days, weeks, or many months, insistently and inexorably carried out, for as long as may be necessary, regardless of urging to the contrary by patient, relatives or physician." [1] "The indispensability of preliminary drainage is too well recognized to require discussion." [2] "To the conservative and to those who have established conspicuously good records in prostatic surgery, the necessity for preoperative drainage is axiomatic. One might just as well seriously question the advisability of hemostasis." With but few exceptions, the patient in no need of preprostatectomy or preresection drainage is in no immediate urgent need of prostatic operation.[3]

Whereas Kretschmer,[4] Bumpus and Massey,[5] Emmett [6] and others interested in prostatic resection have advocated minimizing the preliminary drainage period, there are the enthusiastic supporters of this method who have advised caution. According to T. M. Davis,[7] "Adequate preliminary treatment is of paramount importance . . . continued until the renal function has become stabilized," while G. J. Thompson,[8] referring to patients with impaired renal function, has said "Let me reiterate that preliminary drainage is an absolute essential." The obvious conclusion is that the advisability of drainage depends on the condition of the individual patient rather than on the type of operation. As long ago as 1938, discussing transurethral resection and perineal prostatectomy, I expressed the opinion that "with only moderate amounts of residual urine and without impairment of renal function . . . preliminary drainage may be fairly safely dispensed with," and, in fact, through the years, have occasionally followed this course. It has been my observation, however, that those persons who did not go through with the usual period of several days of preoperative elevation of temperature were most likely to experience a postoperative flare-up of pyelonephritis. Quoting further, "I much prefer to drain than be sorry, and follow this procedure with all but the conspicuously good risks." These statements continue true, and always will, as applied to patients with impaired renal function. Which brings to attention the chief item for emphasis, as well as the occasion for this paper, namely the fact that urologic surgeons, for reasons outlined hereafter, are now seeing a much larger percentage of patients who present a conspicuously good risk.

The factors responsible for this fundamental change in the attitude of the medical profession and of the public may be enumerated as follows:

1. The gradual recognition as fallacious of the tradition that prostatectomy is a hazardous ordeal.
2. The development and popularizing of transurethral prostatic surgery.
3. Popular lay magazine articles on genitourinary subjects.
4. Syndicated newspaper articles by reputable medical columnists.
5. Ethical "public enlightenment" programs, sponsored by medical societies.
6. "Protect your health" magazine advertisements sponsored by life insurance companies.
7. Persistent, blatant, radio advertisement by utterly unscrupulous charlatans.
8. The introduction of the sulfonamide group of urinary tract antiseptics.
9. What may be termed the modern tendency toward lay enlightenment.

These influences combined, increasing public knowledge and the physician's confidence and decreasing the patient's dread, have been responsible for this fundamental and highly desirable change, which has made its spontaneous appearance, unsought and unplanned by the urologist. It has been realized that prostatectomy under proper conditions is not hazardous. Neither is it an ordeal. The dramatic lowering of the prostatectomy mortality rate, resulting from a better understanding of the problems relating to uremia, anesthesia, hemorrhage and infection, has had its influence but has probably been a less important factor than it should be. The popularizing of transurethral prostatic resection, resulting in wide publicity which emphasizes short term hospitalization and perhaps overemphasizes the innocence and simplicity of this procedure, has undoubtedly been an important influence in creating public confidence and willingness. Popular lay magazine writers, often inaccurate in their statements and painting unnecessarily lurid pictures, have aroused interest and curiosity, as have the syndicated newspaper columnists, the publicity programs sponsored by medical societies and the life

From the University of Nebraska College of Medicine.

1. Davis, Edwin: Factors Tending to Minimize the Prostatectomy Hazard, Tr. Am. A. Genito-Urin. Surgeons **31:** 383, 1938.
2. Davis, Edwin: Technic and Results in Perineal Prostatectomy, J. A. M. A. **115:** 582 (Aug. 24) 1940.
3. Davis, Edwin: Prostatectomy or Transurethral Prostatic Resection, J. A. M. A. **112:** 681 (Feb. 25) 1939.
4. Kretschmer, H. L.: Transurethral Resection, Ann. Surg. **104:** 917 (Nov.) 1936.
5. Bumpus, H. C., and Massey, B. D.: Transurethral Resection: Does It Require as Exacting a Preoperative Preparation as Prostatectomy? California & West. Med. **46:** 89 (Feb.) 1937.
6. Emmett, J. L.: Prostatic Resection, J. A. M. A. **110:** 1807 (May 28) 1938.
7. Davis, T. M.: Transurethral Prostatic Resection, with Report of 748 Cases, South. M. J. **28:** 693 (Aug.) 1935.
8. Thompson, G. J.: Transurethral Surgery, Texas State J. Med. **32:** 735 (March) 1937.

insurance advertisements. Each of these causes has had its influence, but the most potent factor of all in making "prostate" a household word and in causing this subject to be regarded as fit for general polite conversation has been the blatant program of fraudulent radio advertisement. It now appears that the deluge of malicious radio propaganda of this kind, designed to deceive and to defraud, has inadvertently rendered a genuine public service. As a certain eminent urologist, referring to one notorious offender, said "He has made us respectable." Present indications are that the use of sulfonamide derivatives has tended to lessen the frequency of postoperative flare-ups of pyelonephritis, thus increasing the confidence of the urologist in undertaking prostatic resection without preliminary drainage. And, finally, this change in the attitude of the public toward prostatic surgery is part of, and in keeping with, the modern trend toward enlightenment and applies in other fields as well. People are now acutely vitamin conscious, and sex hormone conscious. In fact, the alphabet of vitamins seems to be less bewildering to the public than to the physician.

Prior to the recent days of enlightenment, the midnight admission of the distressed and suffering old man with bladder visibly distended and urethra traumatized, bleeding and impassable was a frequent occurrence. I recall the necessity not many years ago in rather a small private urologic practice for emergency suprapubic cystostomy daily for eleven consecutive days. In contrast, there was occasion for but one such operation during the twelve months following Jan. 1, 1940. While it is of course true that there are now many more efficiently operated small town hospitals, where such emergency operations are performed, the fundamental reason why comparatively few patients in desperate condition are now seen is the earlier recognition of prostatic obstruction by the intelligent physician and proper advice before the patient is desperately ill, coupled with the willingness of better informed patients to accept such advice. In former days the elderly patient was more or less uremic, often was disoriented and sometimes was delirious or even comatose. Under such conditions to omit preliminary drainage was almost equivalent to signing the death certificate. The patient faced many weeks or even months of hospitalization, with retention catheter or suprapubic drainage. There was no other way except to return the patient to his home burdened with the care of a suprapubic tube.

Today both physician and prospective patient, encouraged by favorable reports on the mortality and functional results of prostatectomy and by the glowing accounts of short term hospitalization offered by transurethral resection, have gradually become more inclined to the view that the hazard of operation is less than the hazard of delay. It has become recognized that to postpone until surgical intervention has become imperative is to increase materially the period of hospitalization, the cost of hospitalization and the risk. By the intelligent, prostatic resection is now regarded as a welcome means of relief rather than *le dernier ressort*.

The so-called conspicuously good risk may be defined as the man of an age for prostatic trouble who is apparently in good general health, with a good appetite, with definitely demonstrable prostatic hypertrophy, with a clearly defined history of recurrent attacks of urinary retention of unquestionable mechanical urinary obstructive symptoms, with residual urine not exceeding a few ounces, with approximately normal reaction to blood nitrogen and phenolsulfonphthalein tests and without evidence of circulatory disturbance. I am not referring to what may be termed "prophylactic" prostatic operations. Obviously, under these circumstances there is nothing to be accomplished by ten days or two weeks of drainage by retention catheter accompanied by the usual flare-up of pyelonephritis unless one feels that there is advantage gained as a result of the immunity supposed to be conferred by "vaccination" of the urinary tract. I am prepared to express no opinion as to whether such advantage is fact or fancy. At any rate, I have felt justified in undertaking perineal prostatectomy without preliminary drainage on a small series of such patients recently under observation. In this series it seemed advisable also to attempt the prevention of postoperative pyelonephritis and the hastening of wound closure by the oral administration of sulfathiazole. Whether this drug is beneficial under these circumstances or whether the urologist is carried away by undue enthusiasm for the new remains for the future to determine. My present opinion, based on a small series only, is that

Summary of Essential Data Obtained from the Case Histories and Hospital Records of Twenty-Four Consecutive "Good Risks" Undergoing Perineal Resection Without Preliminary Drainage

	Average
Age	67
Residual urine (ounces)	3*
Nonprotein nitrogen (mg.)	35
Preliminary drainage (days)	0
Size of prostate (Gm.)	49
Maximum postoperative temperature	99.9†
Maintenance of urethral catheter (days)	12
Perineal urinary drainage (days)	3
Last day of perineal drainage	7th
Postoperative hospitalization (days)	15
Total (necessary) hospitalization	16

* This average figure does not include the figure for residual urine in the 3 cases of complete retention.
† See chart 2.

sulfathiazole given by mouth tends both to lessen the postprostatectomy elevation of temperature and to hasten the closure of the perineal incision. Of importance in this connection is the recent article by Young, Hill and Semans [9] describing decidedly better wound healing following plastic procedures for hypospadias with postoperative oral administration of this drug.

This preliminary report, including 24 case histories summarized in the accompanying table, is presented with the purpose of emphasizing (1) omission of preliminary drainage, (2) negligible postoperative elevation of temperature, (3) rapid closure of the perineal fistula and particularly (4) the almost incredibly short period of hospitalization, which compares favorably with that for transurethral resection. All the patients were in good general condition considering the average age. All were operated on via the perineal route under sacral block anesthesia with no sedative other than ¼ grain (0.01 Gm.) of morphine sulfate. The operative technic, governed by the fundamental principles long since laid down by Hugh Young, has been described elsewhere [2] with emphasis on meticulous care in suture ligation of the bleeding points and on the obliteration by suture of the prostatic cavity, although complete plastic closure

9. Young, H. H.; Hill, Justina H., and Semans, J. H.: Use of Sulfathiazole Before and After Urologic Operations to Prevent or Combat Infection, J. Urol. **44**: 714 (Nov.) 1940.

without drainage was carried out in no instance. Each patient received 0.5 Gm. of sulfathiazole orally four times daily during the first ten postoperative days, while in half the series 5 Gm. of sulfathiazole powder was deposited in the incision. Whether this drug employed locally after perineal prostatectomy tends to accelerate or to retard wound closure is debatable. My impression, based merely on observation of 12 patients who had and 12 who did not have the drug applied locally, is that antiseptic value is outweighed by tissue injury. The combined perineal drainage and hemostatic bag employed as a safety measure and slipped out in most instances after twenty-four hours appeared to interfere in no way with rapid wound healing. Drainage by urethral catheter was maintained for an average period of twelve days. Each of the patients made an uneventful recovery.

The patients came under observation in rapid succession. Except the first, the operations all were performed during a three month period. The point to be stressed is that during this time the admission of "conspicuously good risks" was decidedly the rule rather than the exception. Ten of the patients were consecutive. In fact, of 28 consecutive prostatectomy patients in my own series, 23 were in sufficiently good condition to permit operation without drainage. This recent "run" of good risks has been as amazing to me as I fear it may be incredible to the reader. Although such a high ratio of good risks may hardly be expected to be maintained indefinitely, there can be no question as to the fundamental character of the change in viewpoint which has taken place. The same tendency is apparent to a lesser degree in public wards. Of the 23 patients, 6 were public ward patients.

Chart 1, depicting 24 superimposed first week postoperative temperature curves, attests the innocence of perineal enucleation under the circumstances previously outlined. It is to be noted that only one of the curves exceeded the 101 F. level. The average first week temperature curve, computed from the daily maximum temperature of each of the 24 patients, reached a peak of 99.9 F. on the second day, as shown in the table and demonstrated graphically by chart 2. No preliminary

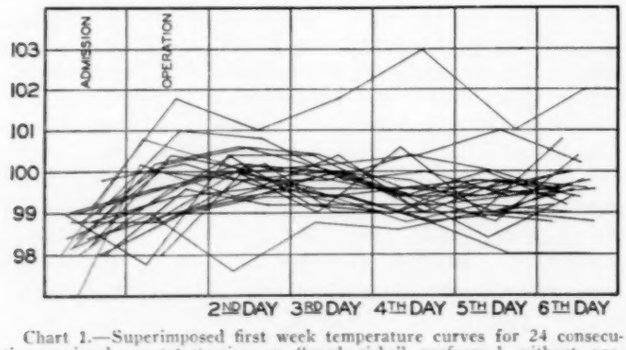

Chart 1.—Superimposed first week temperature curves for 24 consecutive perineal prostatectomies on "good risks" performed without preliminary drainage. Each curve is plotted to show only the maximum daily elevation.

drainage was done in any case included in the table, although 1 patient had had interval catheterization prior to admission. It is to be observed that the average number of days of postoperative perineal urinary drainage (three) is by no means identical with the average time (seven days) which elapsed between the date of operation and the last day of perineal drainage. The apparent discrepancy between these two sets of figures is due to the fact that urinary saturation of the perineal dressings during the average twelve day period of postoperative retention catheter drainage was decidedly the exception. In most instances such perineal urinary drainage as occurred was noted during the first or second postoperative day and also for a day or two after the removal of the retention catheter. The average total number of days of hospitalization exceeded the average period of postoperative hospitalization by one

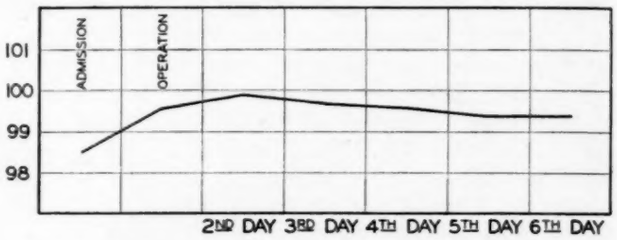

Chart 2.—Average maximum daily elevation of temperature following perineal prostatectomy on "good risks," based on the twenty-four consecutive superimposed curves shown in chart 1.

day only, since the patients were operated on the day after admission, after completion of the physical examination and functional tests. The average total hospitalization figure included the figure for 1 charity ward patient who had no postoperative perineal drainage whatever but who remained in the hospital for three postoperative weeks because of unexplained pain in the hip. The expression "total necessary hospitalization" is properly employed, since in a few instances the operation was postponed a day or two in order to suit the convenience of the surgical staff and since the patient himself occasionally elected to remain in the hospital after dismissal awaiting the arrival of relatives or for other reasons wholly unrelated to his physical condition. These extra unnecessary days have been excluded in figuring the total period of hospitalization. The average age was 67, the average residual urine (excluding that in 3 cases of complete retention) 3 ounces (85 cc.) and the average size of the prostate 49 Gm. Although the number of days of postoperative perineal urinary drainage averaged three, 7 patients (30 per cent) had no perineal urinary drainage whatever. The total preoperative and postoperative hospitalization averaged sixteen days. These records have been checked by my colleague, Dr. C. A. Owens, who has made similar observations.

SUMMARY

By reason of recently increased public enlightenment and "prostate consciousness," the urologic surgeon now sees a much larger percentage of "conspicuously good risks," who permit safe prostatectomy without preliminary drainage.

The results obtained in a series of 24 consecutive cases in which the risk was particularly good indicate that the average total period of preoperative and postoperative hospitalization in the case of good risks may be reduced to a figure not exceeding sixteen days.

This exceedingly short average total hospitalization for perineal prostatectomy tends to nullify the chief argument of authorities advocating routine or indiscriminate transurethral resection rather than selection of cases.

The opinion here expressed is not to be interpreted as blanket approval of prostatectomy without preliminary drainage, the necessity of which will always obtain in cases with impairment of renal function.

CUTANEOUS TEST WITH DIODRAST TO PREDICT ALLERGIC SYSTEMIC REACTIONS

FROM DIODRAST GIVEN INTRAVENOUSLY

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AND
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Systemic reactions following the intravenous administration of diodrast for excretory pyelography are frequently disturbing and occasionally serious. Many of the symptoms, such as sneezing, urticaria and wheezing, resemble allergic manifestations so closely as to suggest that allergy to the diodrast may be a cause for the reactions. On one occasion, after it was first determined that the intradermal injection of small amounts of diodrast was painless and caused no systemic reaction, increasing concentrations of diodrast were injected into the skin of a patient who had recovered from a severe reaction to diodrast given intravenously; there was a strong positive cutaneous reaction when 0.05 cc. of undiluted diodrast was injected intradermally. It was therefore decided to test in a similar manner all patients who were to receive diodrast intravenously for pyelography. The methods used and the results in a consecutive series of 404 patients are presented.

METHODS

On arrival in the roentgen ray department for intravenous pyelography, each patient was questioned regarding his family history and personal history relative to allergy. An intradermal cutaneous test was performed with 0.05 cc. of undiluted diodrast injected into the skin of the forearm, an injection of the same amount of saline solution being used as a control; the diameter of the wheal and the area of erythema were measured after ten to fifteen minutes. Diodrast was then given intravenously in the usual manner for pyelography, regardless of the result of the cutaneous test; symptoms were recorded as they occurred.

RESULTS

The 404 patients were divided into two groups: 323 patients who had no general reaction to diodrast intravenously and 81 patients who did have a general reaction. Each group was then subdivided according to the severity of the local reaction to the cutaneous test. The local reaction to a cutaneous test resembled that occurring in foreign protein hypersensitivity in that it developed quickly after the injection, reached a maximum in ten to twenty minutes and faded quickly thereafter, disappearing completely. It consisted of an increasing wheal with a surrounding zone of erythema; there was pseudopod formation in the larger reactions. In 15 instances erythema did not appear although a wheal up to 10 mm. occurred. Occasionally the wheal did not increase greatly, and the erythema predominated in the reaction. The reaction to a cutaneous test was considered (1) negative when the wheal measured less than 8 mm. and the erythema less than 10 mm., (2) slightly positive when the wheal measured 8 or 9 mm. with no erythema or when the wheal measured less than 8 mm. and the erythema 10 mm. or more in diameter, (3) moderately positive when the wheal measured 10 to 15 mm. and (4) strongly positive when the wheal measured more than 15 mm.

Of the 323 patients with no general reaction (table 1), 235 (72.8 per cent) had negative cutaneous reactions and 88 (27.2 per cent) positive. Of the 81 patients who did have a general reaction, on the other hand, only 14 (17.2 per cent) had negative cutaneous reactions while 67 (82.8 per cent) had positive reactions. Of the 88 patients with positive cutaneous reactions and no general reaction (table 2), 75 (85.2 per cent) had only slightly positive cutaneous reactions and 13 (14.8 per cent) moderately positive reactions. No patient who had no general reaction had a strongly positive cutaneous reaction. Of the 67 patients who had both positive cutaneous reactions and general reactions, 43 (64.1 per cent) had slightly positive cutaneous reactions, 22 (32.7 per cent) had moderately positive cutaneous reactions and 2 (2.9 per cent) had strongly positive cutaneous reactions. It is evident that the patients with general reactions had a significantly higher percentage of positive cutaneous reactions than the patients who did not have general reactions. The sites of the cutaneous reactions in the patients with general reactions tended to be larger than those in the patients who did not have general reactions.

There were 249 patients with negative reactions to the cutaneous tests; of these 14 (5.6 per cent) had general reactions. One hundred and eighteen patients had slightly positive cutaneous reactions, of whom 43 (36.4 per cent) had a general reaction. Thirty-five patients had moderately positive cutaneous reactions, of whom 22 (62.8 per cent) had a general reaction. There were 2 patients who had strongly positive cutaneous reactions, and both had general reactions. This would indicate that with a negative cutaneous reaction there is approximately one chance in twenty of having a general reaction, and as the cutaneous reaction becomes more strongly positive the chance of a general reaction developing progressively increases.

TABLE 1.—*Incidence of General Reactions and Positive Reactions to Cutaneous Tests*

General Reaction	Number of Patients	Reaction to Cutaneous Tests: Negative Number	Negative Per Cent	Positive Number	Positive Per Cent
Absent	323	235	72.8	88	27.2
Present	81	14	17.2	67	82.8

There is no reliable method of determining whether or not a reaction is due to allergy. Therefore, any symptoms following the administration of diodrast was considered a general reaction. The most common reaction involved the gastrointestinal tract and consisted of nausea, with or without vomiting; it occurred in 57 (70.3 per cent) of the 81 patients with general reactions. The next most frequent manifestation of a reaction was urticaria, varying from a few localized wheals to generalized urticaria; this occurred in 20 (24.6 per cent) of the patients with reactions. Nasal symptoms of stuffiness and sneezing occurred in 5 of the patients (6.1 per cent). Three patients (3.7 per cent) had "chest" symptoms; 1 with a wheal of 4 mm. and erythema of 12 mm. from the cutaneous test, vomited, coughed and choked for three minutes, the symptoms beginning about one-half minute after the injection; a second, with a wheal of 8 mm. and erythema of 11 mm. as a result of the cutaneous test, choked, coughed, became cyanotic and "brought up yellow fluid" for two to three minutes; the

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third patient, with a reaction consisting of a wheal of 20 mm. and erythema of 40 mm., had choking and cardiovascular collapse necessitating admission to the hospital. Seven patients (8.6 per cent) had miscellaneous symptoms, consisting of (1) pallor, (2) faintness during injection, (3) toxic encephalopathy, (4) pallor and sweating, (5) faintness after injection, (6) nausea, dizziness, increased pulse rate, chill and "shaking" and (7) vomiting, cyanosis, chills and "generalized discomfort" followed by a temperature of 101 F.

Comparison of the reactions to cutaneous tests with the severity of the general reaction revealed considerable variation. Some of the patients with negative or slightly positive cutaneous reaction had general reactions more severe than patients with moderately positive cutaneous reactions. Nevertheless, in general the more severe reactions occurred in those patients having more strongly positive cutaneous reactions. The 2 patients who had strongly positive cutaneous reactions had severe general reactions.

TABLE 2.—*Degree of Positive Reactions to Cutaneous Tests in Patients Without and With General Reactions*

General Reaction	Number of Patients	Reactions to Cutaneous Tests: Slightly Positive, Number	Slightly Positive, Per Cent	Moderately Positive, Number	Moderately Positive, Per Cent	Strongly Positive, Number	Strongly Positive, Per Cent
Absent	88	75	85.2	13	14.8	0	0
Present	67	43	64.1	22	32.7	2	2.9

TABLE 3.—*Family and Personal History of Allergy in Patients with Negative and Positive Reactions to Cutaneous Tests*

History of Allergy	Negative Reactions to Cutaneous Tests (249 Patients): Number	Negative Reactions to Cutaneous Tests (249 Patients): Per Cent	Positive Reactions to Cutaneous Tests (145 Patients): Number	Positive Reactions to Cutaneous Tests (145 Patients): Per Cent
Family	17	6.8	27	18.8
Personal	9	3.6	31	21.3

The relation between the history of allergy and the result of the cutaneous test is presented in table 3. The patients with negative reactions to cutaneous tests had familial and personal histories of allergy similar to that in the general population, while among patients with positive reactions to cutaneous tests there was a considerably higher incidence of familial and personal history of allergy.

Each patient was questioned regarding previous contact with iodides. The information obtained could not be considered reliable, however, and no attempt was made to correlate this with the results of cutaneous tests or with the occurrence of general reactions.

COMMENT

The data of the present study have some bearing on the question as to whether or not reactions following intravenous injection of diodrast are due to allergy. Eighty-eight patients had no general reactions but did have positive cutaneous reactions, 75 of which were slightly positive and only 13 moderately positive. On the other hand, 14 patients, 3.4 per cent of the total number studied, had general reactions with negative reactions to cutaneous tests. This discrepancy is not unusual for allergic conditions. In other forms of allergy, e. g. hay fever, patients with clinical sensitivity may have negative reactions to cutaneous tests, and other patients with positive cutaneous reactions may not have clinical sensitivity. The disturbances observed clinically during general reactions to diodrast, such as urticaria, nasal obstruction and sneezing, choking, wheezing and vasomotor collapse, are similar to the reactions occurring with "serum sickness." The character of the reaction to the cutaneous test with diodrast is also typical of allergy. Accordingly, allergy to diodrast must be considered a cause for the general reaction. This hypersensitvity, fortunately, must be very slight, since 0.05 cc. of the undiluted solution was used in the intradermal tests, whereas in pollen sensitivity comparable intradermal reactions are frequently obtained with dilutions of pollen extract of 1: 100,000 or more.

The mechanism of the hypersensitivity must await further study. In an attempt to demonstrate antibodies by inducing passive transfer, 0.1 cc. of serum from a patient who had a strongly positive cutaneous reaction was injected intradermally into 2 normal subjects; no reaction occurred when the passive transfer sites were treated with 0.05 cc. of diodrast. Since diodrast is a compound rather than a simple chemical substance, cutaneous tests should be done with its various components.

The value of cutaneous tests in predicting serious general reactions to diodrast is demonstrated by the results of this study. The most serious reaction to be expected is vasomotor collapse with death, probably the result of allergy. Other reactions, whether allergic or not, may be mildly or moderately distressing but otherwise are usually not of great importance. In this series, 77 general reactions were mild to moderate and were associated with negative to moderately positive cutaneous reactions.

There were 3 serious reactions. The first of these occurred in a 29 year old woman in whom intravenous pyelography was performed because of hematuria and dysuria. There was no family or personal history of allergy. She had not received diodrast previously. The reaction to a cutaneous test consisted of a wheal 5 by 6 mm., with no erythema. She was given 20 cc. of diodrast intravenously, and, according to the nurse in attendance:

> Three minutes later, she became restless, moved all about the table and failed to respond to questions. The skin was was warm and moist. The pulse was regular, of good quality and not rapid. In about ten minutes the patient became quieter. This was soon followed by another episode similar to that just described but less severe. At this time she started muttering irrationally. The skin was still warm and moist and the pulse good. After another ten minutes she quieted down. The skin became cold and pale. The pulse remained good. Epinephrine, 4 minims (0.25 cc.), was given after fifteen minutes.

The patient was later observed by a consulting neurologist, who made the following note:

> The occurrence of stupor with absent reflexes, followed by great irritability and twitching, with reflexes only partly returned, together with mutism and automatic and limited answers, indicates a widespread cortical, probably encephalopathic, response to a toxic influence.

There was a gradual return to normal in the next few days. This reaction is not typical of the allergic type, and a positive reaction to a cutaneous test could not, therefore, be expected.

Another serious reaction occurred in a 53 year old woman who was studied for pain in the right side. After receiving 20 cc. of diodrast she became cyanotic

and dyspneic and collapsed. She was admitted to the ward, where she was reported as being cyanotic, with a barely perceptible pulse, clammy skin and a blood pressure of 90 systolic and 50 diastolic. She was placed in shock position and given epinephrine subcutaneously in 0.5 cc. doses to maintain the blood pressure at 100 systolic and 60 diastolic. The patient gradually became warmer and more comfortable, the cyanosis giving way to erythema without wheals. There was a rise in temperature to 102.5 F., which returned to normal the following morning. At this time she felt normal and stated she had previously felt as if she were dying. The reaction to a cutaneous test at this time was strongly positive, consisting of a 20 mm. wheal and 40 mm. zone of erythema. The cutaneous test was repeated one week later and elicited a similar reaction.

The third severe reaction occurred in a 30 year old man with hay fever who was studied because of essential hypertension. A cutaneous test elicited a wheal 20 by 20 mm. and a zone of erythema 35 by 30 mm., but the control test with saline solution elicited a wheal 6 by 16 mm. and a zone of erythema 30 by 30 mm. Because of the strongly positive cutaneous reactions the diodrast was injected slowly; according to the attending nurse:

> With the injection of a few cubic centimeters [7 cc.] the patient became very flushed, the eyes reddened and became itchy, wheals came on the face and neck and the patient felt "funny." Five-tenths cc. of epinephrine was given subcutaneously, the wheals disappeared and he became pale and felt better.

Cutaneous tests were repeated some weeks later, and he showed a wheal 20 by 20 mm. and a zone of erythema 60 by 60 mm. with both diodrast and saline solution. He was given 13 cc. of saline solution intravenously with no reaction. A passive transfer study was done by injecting his serum into 2 recipients, but no reaction occurred with diodrast or saline solution.

The 2 patients with severe general reactions typical of allergic reactions had the most strongly positive cutaneous reactions, consisting of wheals, with pseudopods, measuring 20 mm., accompanied by large areas of erythema. Until more information is obtained, it would seem prudent to perform cutaneous tests on all patients before diodrast is given intravenously, and for those patients showing cutaneous reactions with wheals of 15 mm. or more, suitable precautions should be taken. The precautions should consist in having epinephrine available for instant use and the slow injection of the diodrast, stopping as soon as untoward symptoms develop. Since about 2 out of 3 patients with moderately to strongly positive reactions to cutaneous tests had general reactions, it may be of advantage to give such patients prophylactically one of the drugs, such as epinephrine or ephedrine, which counteracts allergic reactions.

CONCLUSIONS

1. One cause for the general reaction following intravenous injection of diodrast is allergy to diodrast.
2. The intradermal cutaneous test with 0.05 cc. of diodrast usually elicits a positive reaction in a patient allergic to diodrast.
3. An intradermal cutaneous test with 0.05 cc. of diodrast should be done on all patients before diodrast is injected intravenously.
4. If the reaction to a cutaneous test is strongly positive, with a wheal larger than 15 mm., a serious general reaction may be expected, and precautions should be taken.

520 Beacon Street.

Clinical Notes, Suggestions and New Instruments

ELIMINATION OF COLOR FROM VISUAL HEMOGLOBINOMETRY

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From their recent studies, involving hundreds of carefully controlled determinations by both physicians and technicians, Karr and Clark [1] conclude that "hemoglobin determinations, as they are done in many laboratories of accredited hospitals with accepted methods, are so inaccurate that they are not only valueless but may well be detrimental to good medical practice." While not every one might have the blunt candor of these investigators, there remains a widely sensed need for a better clinical method of hemoglobin determination than the methods now in use.

A method is here described that can be carried out complete in sixty seconds, including two or three readings, readings which in my practice seldom vary as much as 0.4 Gm. (2 per cent) and which can be performed with a relatively inexpensive and reasonably foolproof photometer that can be folded up and carried in the pocket.

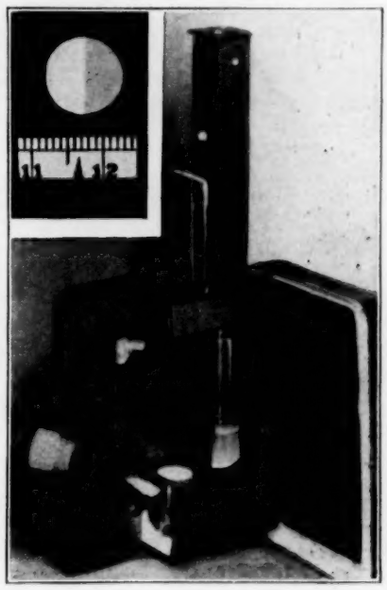

Fig. 1.—Pocket size photometer for visual determination of hemoglobin by photoelectric methods without recourse to the photoelectric cell. The instrument is shown detached from its base, as for use in an automobile. The inset at left shows the view through the eyepiece.

The underlying principle of the method is that green light is absorbed by red, such as the red of oxyhemoglobin, in a solution. The more hemoglobin present, the less green light will pass through the solution. If one has a constant source of light, together with means for measuring the amount of green light that does get through, the hemoglobin content can be quickly and accurately measured. This is exactly the principle of the photoelectric colorimetric oxyhemoglobin method, which was found by Karr and Clark to be the best of the methods tested by them.

Notwithstanding a scholarly presentation by Kennedy [2] sixteen years ago and its independent application by Sunderman in an unpublished method,[3] it seems to have been quite overlooked that this excellent principle (heretofore inadvertently monopolized by the photoelectric colorimeter) can be most satisfactorily employed visually in any ordinary colorimeter without recourse to the photoelectric eye, yet without sacrifice of accuracy. The specifications for the green light filter, however, are considerably more exacting for visual than for photoelectric use.[4]

It is pertinent to note that the normal retina is appreciably more sensitive to minute differences in intensity of green light than it is to such differences of red, yellow or blue light. This

1. Karr, W. G., and Clark, J. H.: Am. J. Clin. Path. **11**: 127 (Sept.) 1941.
2. Kennedy, R. P.: The Use of Light Filters in Colorimetry, with a Method for the Estimation of Hemoglobin, Am. J. Physiol. **78**: 56 (Sept.) 1926.
3. Sunderman, F. W.: Personal communication to the author.
4. Theoretically the transmission of the filter should correspond closely with the absorption spectrum of oxyhemoglobin. A number 62 Wratten filter does well, though it does not have very high total transmission. Kennedy used a number 74 filter.

means that green is the color of choice for precision in matching luminosity visually. As for the bogy of visual fatigue, I find distinctly less eyestrain in looking at greens than in peering at the pointer of an electrical device.

So narrow is the transmission band of the filter employed (number 74 and so on) that this same filter gives satisfactory readings in nearly all colorimetric tests, such as blood sugar and sulfonamide drug concentrations. In fact, number 74 is the filter specified by Sunderman and Pepper [5] in their serum concentration sulfathiazole method.

Fig. 2.—Instrument and pipet assembled in case for carrying.

For utilizing the visual method a simple pocket size photometer (figs. 1 and 2) has been constructed. The instrument is similar in principle to the conventional microcolorimeter except that but one solution cup is used and no syringe or plungers are employed. Luminosity of the controlled half of the visual field is governed by a sliding "optical wedge" of neutral gray interposed between that half field and the illuminant. Through the other half field is seen the cell of blood dilution, so that were it not for the green filter the field would appear half red and half gray.

Seen through the filter, however—and this is the whole point—the halves of the field are neither red nor gray but green. One has only to cause these contiguous areas of green to become of equal brightness by manipulation of the sliding gray wedge and then read the answer directly from the scale without taking the eye from the eyepiece, so several readings may be quickly made. To preclude "wishful" readings the scale is concealed by an occluder until it is desired to take a reading. The scale is divided into equal parts, either grams or percentage as preferred.

In designing the instrument, I took care to choose any parts liable to breakage or replacement so that they would be obtainable at trifling cost almost anywhere. The illuminant, for instance, is a small 6 volt bulb replaceable in nearly any dime store. The pipet is the ordinary 20 cu. mm. Sahli pipet, carried in stock by all surgical supply houses.[6] The solution cup is an ordinary 14 mm. flat bottom vial, carefully selected for size. Contrary to theoretical apprehensions, in reality neither the meniscus of the free fluid surface nor lack of optical planiety of the vial bottoms introduces any detectable error. The 6 volt bulb was chosen so that, while it is commonly lighted from a small transformer in the base of the instrument when 110 volt current is available, where this current is not available the detachable base and transformer may be left behind and the instrument lighted directly from the battery of an automobile through a wire from the dashboard or even from a standard lantern battery.

PROCEDURE

Precisely 20 cu. mm. of blood is blown from an accurately calibrated Sahli pipet [2] into approximately 2 cc. of dilute alkali in the vial which serves as solution cup. Either 0.1 per cent sodium carbonate or 0.4 per cent ammonium hydroxide (4 cc. of 28 per cent ammonium hydroxide to the liter of distilled water) may be used. The quantity of blood is the only factor requiring precision measurement. Unlike the plunger type of colorimeter, this instrument does not require an exact amount of diluent.

If ammonium hydroxide solution is used, the vial may be slipped into place and the reading made at once if desired, with no waiting for an electric cell to warm up or for color to develop. Corked vials may be collected when one is making rounds, for reading on return to the laboratory.

First Attempts of Inexperienced Children

Reading of Child Aged 14, Gm.		Readings of Child Aged 12, Gm.
14.2	9.3	9.3
14.2	9.3	9.4
14.15	9.55	9.5
14.2	9.25	9.3
14.35	9.4	9.7
14.2		

I have used the method here described in my practice for nearly two years with utmost satisfaction.[7]

To see what could be done by utterly inexperienced persons who did not know too much, I invited 2 school children aged 12 and 14 years who had never seen a colorimeter to make readings. The results shown in the accompanying table are their first (blind) readings after one minute's instruction with no practice allowed; all readings are given.

TYPHOID PULMONARY ABSCESS

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Pulmonary abscess complicating typhoid is not unusual; such an abscess of proved typhoid etiology is more rare. The first available report was that of Mussey to the Anatomy Society of Paris in 1838.[1] Postmortem examination on a patient with typhoid showed multiple metastatic pulmonary abscesses.

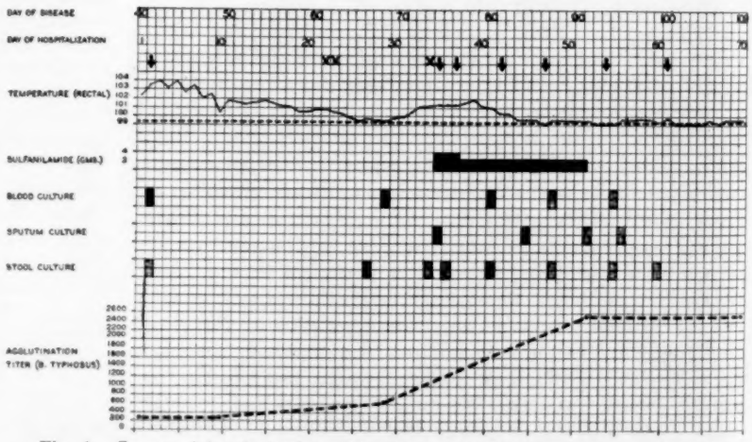


Fig. 1.—Course of hospitalization. Temperatures are daily averages of six determinations. Solid blocks indicate positive cultures, stippled blocks negative cultures; arrows indicate chest roentgenograms, ×'s hemoptyses.

Griesinger [2] reported 7 cases of pulmonary gangrene among 118 patients with typhoid coming to necropsy, and von Liebermeister [3] cited 14 cases of pulmonary gangrene found on necropsy examination of 230 patients with typhoid.

5. Sunderman, F. W., and Pepper, O. H. P.: Am. J. M. Sc. **200:** 790 (Dec.) 1940.

6. For any close approach to absolute values the pipet should be calibrated by the United States Bureau of Standards. Accuracy of pipets as purchased is not high, one large manufacturer claiming no closer tolerance than 5 per cent. H. L. Alt, of Northwestern University Medical School, said in a personal communication that the Hellige has been found most accurate of the pipets tested by him.

7. Sometimes physicians or technicians are a bit too smug or hurried to give even a few moments attention to mastering details of technic for a new method, details of which, however, may be imperative to accuracy.

From the Medical Service of the University of Michigan Hospital, Ann Arbor.

1. Mussey, G.: Excerpts from the Verbal Proceedings of the Society, Bull. Soc. anat. de Paris **2:** 41 (April) 1838.

2. Griesinger, Wilhelm, in Virchow, Rudolf: Handbuch der Speciellen Pathologie und Therapie, ed. 2, Erlangen, Germany, Ferdinand Enke, 1864, vol. 2.

3. von Liebermeister, Karl: Typhoid Fever, in Ziemssen, H. von: Cyclopedia of the Practice of Medicine, New York; William Wood & Co., 1874, vol. 1, p. 172.

Pulmonary abscess of proved typhoid etiology must of necessity date from the recognition of the stained typhoid bacillus by Eberth in 1880 and of its cultural and differential bacteriologic characteristics by Gaffky in 1884 and Escherich in 1885. Since that period of isolation of the causative organism 7 cases of pulmonary abscess complicating typhoid and 1 case of such abscess complicating a paratyphoid infection have been reported.[4]

Three of these communications present bacteriologic evidence substantiating the specific typhoid etiology of the complication. Basch[5] reported that a patient with typhoid on the fifteenth day of the illness showed signs and symptoms of lobar consolidation in the right lung. Examination of the sputum revealed a pure culture of Eberthella typhosa for a period of two months. Examination for the tubercle bacilli and pneumococci gave negative results. Roentgenograms of the chest showed an abscess at the angle of the right scapula. The outcome was not mentioned.

Chini[6] presented a patient who for a year had periodic attacks of cough and "catarrh" lasting from fifteen to twenty days, with good health in the intervening time except for continuous pain in the left side of the chest. Immediately prior to examination there was anorexia, low grade fever, epigastric pain and vomiting. Roentgen examination of the chest showed an opacity at the base of the left lung interpreted as free fluid with pulmonary excavation and a bronchopleural fistula. Postural drainage yielded pus of the same character as that obtained by thoracentesis, both of which showed a pure culture of Eberthella typhosa. It was the author's opinion that the patient had an ambulatory form of typhoid with abscess localization in a locus minoris resistentiae.

Thimm[7] examined a patient whose history revealed that four weeks prior to examination there had been chills, fever and malaise which subsided but which was followed three weeks later by recurrence of the symptoms with the addition of pain in the anterior part of the left side of the chest. An exudate obtained from the left pleural space yielded a pure culture of Eberthella paratyphosa, its subclassification not mentioned. Roentgenograms of the chest showed a pulmonary abscess with fluid level. Six days later a paroxysm of coughing was productive of foul blood-tinged sputum in which there were numerous paratyphoid bacilli. Roentgenograms nine weeks later showed a small infiltration the size of a quarter (24 mm.).

To these 3 reports of typhoid and paratyphoid pulmonary abscess a fourth is here added.

REPORT OF CASE

G. R., a white man aged 36, was admitted to the University Hospital Feb. 3, 1938. Thirty-nine days previously he experienced a chill of fifteen minutes' duration followed by a sensation of fever. These chills recurred four or five times a week at no regular intervals and there was daily fever. The week prior to admission there was a morning cough productive of what was thought to be postnasal drip. On several occasions this material had been bloody, but the evaluation of this symptom was complicated by the presence of concurrent epistaxis.

On examination the patient was emaciated and apathetic and was acutely ill. The rectal temperature was 102.8 F., the pulse rate 104, the respiratory rate 18 and the blood pressure 110 systolic and 80 diastolic. A blood clot was present in the left side of the nose. Breath was foul and there was profuse mucopurulent material on the posterior pharynx. At the apex of the left lung breath sounds were slightly diminished in intensity, and occasional post-tussive rales were heard. The spleen was palpable at the rib margin and descended 3 cm. on deep inspiration, the edge being sharp and nontender. The liver edge was just palpable in the midclavicular line on deep inspiration. The remainder of the physical examination gave negative results.

Leukocytes numbered 6,000 per cubic millimeter with 80 per cent polymorphonuclear neutrophils. There was 1 plus albuminuria with occasional red and white blood cells in the urinary sediment. Bacteriologic examination isolated Eberthella typhosa from the blood, stool and sputum on numerous occasions, as shown in figure 1.

The chest was examined with roentgen rays on seven different occasions. The initial film at the time of admission was negative (fig. 2). Roentgenograms on the thirty-fifth hospital day following a hemoptysis and again one week later (fig. 3) showed a pulmonary abscess in the midaxillary portion of the upper lobe of the left lung. Subsequent roentgen examinations showed progressive clearing of this abscess (fig. 4).

The course of the illness is outlined in the accompanying chart (fig. 1). Each recorded level of temperature is a daily average of six rectal determinations, there being wide fluctuations not apparent on the chart for this reason. The tempera-

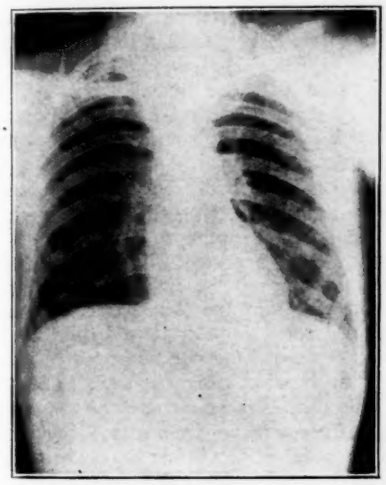


Fig. 2.—Appearance of the chest on admission to the hospital; negative.

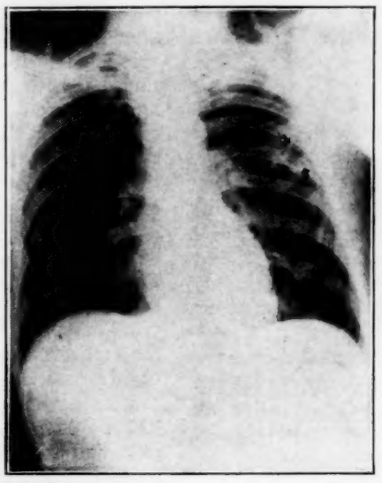


Fig. 3.—Appearance of the chest on the forty-second hospital day. There is a large pulmonary abscess at the level of the third left anterior interspace and the fourth rib.

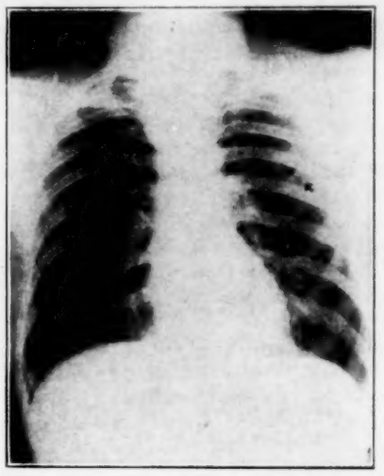


Fig. 4.—Appearance of the chest at the time of discharge; persistent pneumatocele at the level of the third left anterior interspace.

4. Ramsey, A. C. L.: Contribution to Pulmonary Surgery, with Report of Four Cases of Pneumotomy, Ann. Surg. **11:** 34 (Jan.) 1890. Acker, G. N.: Gangrene of the Lungs Complicating Typhoid Fever, Arch. Pediat. **13:** 660 (Aug.) 1896. Bullowa, J. G. M.: Typhoid Fever with Chills, Fever and Sweats; Typhoid Abscess in Rectus Abdominis Sheath; Typhoid Pulmonary Involvement; Recovery, M. Clin. North America **10:** 955 (Jan.) 1927. Chalier, J.: Abscès pulmonaire gangreneux au cours de la fièvre typhoide, Lyon méd. **154:** 475 (Nov. 4) 1934. Basch.[5] Thimm.[7] Chini.[6]

5. Basch, S.: Report of a Case of Typhoid Fever Complicated by a Pure Typhoid Pneumonia and Pulmonary Abscess, M. Rec. **87:** 539 (March 27) 1915.

6. Chini, V.: Abscesso polmonare tifico con perforazione nel cavo pleurico e pio-pneumotorace consensuale, Policlinico (sez. prat.) **39:** 3 (Jan. 4) 1932.

7. Thimm, A.: Ein Fall von paratyphösem Lungenabszess, Med. Klin. **27:** 1069 (July 17) 1931.

ture subsided gradually and became normal during the latter part of the fourth hospital week. This was followed by a recrudescence of the febrile course during which sulfanilamide was administered. On the twenty-first and twenty-second hospital days (sixty-first and sixty-second days of the illness) there was pain in the left upper anterior part of the chest and blood streaked sputum. Physical examination at that time gave negative results. Except for slight discomfort in the left side of the chest there were no other pulmonary symptoms until eleven days later, at which time there was a small hemoptysis, culture of which yielded E. typhosa. On this occasion, roentgenograms of the chest showed a pulmonary abscess. The blood culture was positive at this time. Following this there was a slight cough with small amounts of sputum, cultures of which were positive for the typhoid bacillus ten days later and negative thereafter. With the advent of negative sputum and blood cultures the temperature subsided and the patient proceeded to an uneventful recovery. At the time of discharge roentgenograms of the chest showed, at the site of the former abscess, a persistent pneumatocele with minimal surrounding inflammatory infiltration (fig. 4). A follow-up letter from the patient thirteen months later informed me that for two weeks after discharge there was slight pain in the left side of the chest but no subsequent symptoms. At that time he was in excellent health. No further roentgenograms were available.

COMMENT

It is realized that the positive sputum cultures were obtained at a time when the bacteremia was still present. However, the second positive sputum contained no apparent blood. The positive sputum cultures and the spontaneous healing of the abscess concurrent with the subsidence of the generalized disease lead one to attribute the pulmonary complication to typhoid etiology rather than to a nonspecific process. It is entirely possible that the abscess may have resulted from a septic embolus.

In the years 1935-1940 at the University Hospital there have been 272 other cases of pulmonary abscess. None of these occurred in typhoid patients. During the same period there were 34 cases of typhoid and 12 cases of paratyphoid fever, no other of which was complicated by pulmonary abscess.

1719 Pacific Avenue.

URETERAL OBSTRUCTION FOLLOWING THE USE OF SULFADIAZINE

SAMUEL L. RAINES, M.D., MEMPHIS, TENN.

Following the use of sulfapyridine and sulfathiazole there have been numerous reports in the literature of renal complications and ureteral obstruction. The case I am reporting is the first of this type to occur after the use of sulfadiazine. In symptomatology it differs little from ureteral obstruction following the administration of other drugs, but there are several points of practical importance that will be of interest.

According to earlier reports, sulfadiazine was more potent, less toxic and less likely to precipitate in the urine than any of the other sulfonamide drugs. Norman Plummer [1] of Bellevue Hospital, Finland [2] of Boston, Long [3] of Johns Hopkins and Flippin and his associates [4] have used sulfadiazine extensively. When all their cases are grouped it is found that they report renal complications in only 3 to 4 per cent of about 1,500 patients treated and only 1 instance in which suppression of the urine or precipitation followed administration of this newer drug. It has been my misfortune to see several patients recently in whom it obviously caused damage and in 1 instance death:

1. Personal communication to Dr. Ching.
2. Finland, Maxwell; Strauss, Elias, and Peterson, O. L.: Sulfadiazine: Therapeutic Evaluation and Toxic Effects on Four Hundred and Forty-Six Patients, J. A. M. A. **116:** 2641-2647 (June 14) 1941.
3. Long, P. H.: Sulfadiazine: The 2-Sulfanilamidopyrimidine Analogue of Sulfanilamide, J. A. M. A. **116:** 2399-2400 (May 24) 1941.
4. Flippin, H. F.; Rose, S. B.; Schwartz, Leon, and Domm, A. H.: Sulfadiazine and Sulfathiazole in the Treatment of Pneumococcic Pneumonia: A Progress Report on 200 Cases, Am. J. M. Sc. **201:** 585-592 (April) 1941.

REPORT OF CASE

W. D., a white man aged 69, was in good health until a few months before admission. Following the extraction of some teeth he began to lose his appetite, which was followed by a loss of weight and vigor. Several weeks later he began having a fever of moderate degree and a cough with a feeling of congestion in his lungs. Urinary examinations disclosed no abnormality, and he was admitted to the Baptist Hospital on August 29 under the care of Dr. W. C. Colbert.

His temperature on admission was 99.3 F., his pulse rate 100 and his respiratory rate 26 a minute. The urinalysis was negative. The white blood cell count was 19,560 with 92 per cent polymorphonuclear leukocytes, 3,700,000 red blood cells and 62 per cent hemoglobin. He had lost about 30 pounds (13.6 Kg.). The physical examination suggested a lung abscess, and this diagnosis was confirmed by a roentgen examination. Thirty grains (2 Gm.) of sulfadiazine was given initially, followed by 15 grains (1 Gm.) every four hours. On the second day the temperature became normal and remained so. On the third day after admission the patient experienced discomfort in the lower part of the abdomen with a feeling of indigestion and gaseous distention. He was given an enema and later gastric lavage, followed by sedatives which gave him partial relief. That evening at 6 o'clock, seventy-two hours after beginning the sulfadiazine, he passed a little blood tinged urine and then stopped voiding. The sulfadiazine was discontinued at once and for two days he was treated symptomatically. During these two days his temperature, pulse and blood pressure remained within normal limits, although he became drowsy and sluggish, and the urinary output remained scanty.

A cystoscopic examination was decided on and on this examination there were found crystals and small concretions on the floor of the bladder. Both ureteral orifices were found bulging and apparently tightly impacted with some substance. I was unable to get a catheter up the right ureter. A number 5 catheter was inserted into the left ureter and met a crunching, crackling resistance in the lower third. After the catheter was inserted several cubic centimeters of cloudy, bloody urine, alkaline in reaction, was obtained. The urine continued to drip a little during the remainder of the manipulation. Thinking that the excretion from one kidney would give the patient partial relief and wishing to spare him the trauma of further forcible manipulations in attempting to open the right ureter, we returned the patient to his room. This catheter drained only 2 or 3 ounces (60 or 90 cc.) a day and he voided about the same amount for two more days. During this time his temperature, puise, respiratory rate and blood pressure remained within normal limits.

On September 5, four days after the onset of anuria, under spinal anesthesia, another examination of the bladder was done. After considerable forcible manipulation with a heavy blunt-nosed number 7 catheter, a number 5 catheter was finally pushed up through the obstructing material in the lower third of the right ureter. About ½ ounce (15 cc.) of cloudy urine was secured through this catheter. The catheters in both ureters were irrigated and left in place, draining nicely. We continued to give dextrose intravenously, which had been started at the onset of anuria, and finally used some Fischer's solution to aid in stimulating urinary excretion. The output continued scanty and the patient became unconscious.

On the second day after the cystoscopic examination, or six days after the onset of partial anuria, the patient's temperature rose to 103 F. The respiratory rate increased and he began to cough. Dr. Colbert concluded that the infectious process in the lung had become active again. The blood pressure was 105 systolic and 50 diastolic, and the white blood cell count was 20,100 with 94 per cent polymorphonuclear leukocytes and the nonprotein nitrogen in the blood was 86 mg. per hundred cubic centimeters of blood. This was surprisingly low in view of six days of anuria. The next day, or one week after the beginning of anuria, the kidneys began to excrete urine copiously. This encouraged us somewhat, although the patient remained critically ill and had a daily rise of temperature and rapid respiratory rate. Dr. Colbert aspirated the right side of the chest and secured about 75 cc. of serous fluid which was

pink from the azosulfamide that had been given intramuscularly the night before. The urinary output continued satisfactory and after two more days, nine days after the beginning of anuria, the temperature went below 100 F. and remained there. The pulse became stabilized at about 90 a minute and the respiratory rate at 38. Improvement continued for another twenty-four hours, and on the tenth day after the onset of anuria the temperature was 99 F., the pulse rate 70, the respiratory rate 20 and the nonprotein nitrogen 29 mg. per hundred cubic centimeters of blood. The patient's general condition seemed greatly improved, although he was stuporous and completely unconscious. Since he had received only dextrose intravenously for nourishment for eight days an attempt was now made to feed him. Fluids, principally proteins, were given by the Levin tube, and at 8 o'clock that night a blood transfusion was given. At midnight he became cyanotic and his muscles began to twitch. His condition grew rapidly worse. The next morning at about 10 o'clock he died.

COMMENT

There are several features of this case that seem worthy of discussion. At the onset his pain was in the abdomen and we did not realize that the ureters were completely blocked. A patient who has had sulfadiazine or any other sulfonamide preparation and who has abdominal pain, a decrease in the urinary output and hematuria should have a cystoscopic examination performed at once to establish the patency of the ureters. One should not wait for the pain to radiate to the flank and kidney region, as it may never do so and valuable time may be lost. Roentgen examinations do not help in the diagnosis, since apparently these concretions do not cast opaque shadows even when present in quantity.

Another patient was seen in the Methodist Hospital by Dr. Hubert Turley. The onset was somewhat the same as in our case. Dr. Turley promptly inserted catheters, thus relieving back pressure, and obtained a rapid response, and the patient lived. We had no trouble in getting up into the left ureter of our patient, but after we had waited four days it took a spinal anesthetic and forcible pressure to open the right ureter. The obstruction on the right side extended about 2 or 3 inches up, and we made our best progress by alternating the use of a blunt-nosed number 7 catheter and a sharp pointed number 5 catheter with a steel stilet in place.

Another point of discussion is whether or not to give alkalis with the sulfonamide type of drug. In the earlier days of sulfanilamide some men advocated alkalis to enable the patient to tolerate the drug better and avoid vomiting. For that purpose alkalis seem of little value. Possibly it would be of some help in the prevention of acetyl sulfadiazine precipitation. Theoretically, and actually, this drug is more soluble in an alkaline solution. If the urine was alkaline to a p_H of 9.6 to 9.7, it would be in the same range as a 10 per cent solution of sodium sulfadiazine. The acetyl form at this same p_H would be exceedingly soluble. Dr. Burbidge [5] states that "the solubility of acetyl sulfadiazine in urine buffered at a p_H of 6.9 is equal to 85 mg. per hundred cubic centimeters. From these figures we can conclude that, the more alkaline the urine, the more soluble the acetyl form of sulfadiazine, and therefore the less chance there is of urinary calculi formation." Spence [6] of Dallas, Texas, in reporting on sulfapyridine deposition in the urinary tract, quoted Tsao in China, who had 4 instances of concretion in an alkaline urine. Schwartz and his associates [7] reported that the use of alkalis in the amount equal to the dosage of the drug prevents the occurrence of crystalluria in patients who are receiving sulfathiazole and sulfadiazine. Gershom Thompson [8] of the Mayo Clinic says that in the case of sulfadiazine this is open to considerable question. Grayson Carroll [1] of St. Louis believes that alkalis are not of any value in this connection and states that heat is the only thing that will dissolve them. It may have been accidental, but I observed that the urine did not begin to excrete during this period of anuria until the temperature had risen to 103 F. On this basis I should consider the use of fever therapy, diathermy or other methods of raising the internal heat level in similar cases.

The consultants raised the question of when to remove the ureteral catheters, pointing out that the mere presence of these catheters sometimes causes a reflex anuria. We were afraid to take them out too quickly for fear there would be sufficient impacted material remaining to block the ureters again. It seemed to me that after the urine began to flow rapidly and was alkalized we could certainly have removed them safely.

Dr. Colbert mentioned that children who are deficient in vitamins and in a poor state of nutrition are much more likely to have ureteral and renal complications following administration of sulfonamides than are others. This might hold true for adults, as in our case. We had a patient who had been in poor general health, was undernourished and probably had a lowered resistance before the drug was given. Dr. Spence [6] mentions dehydration as a predisposing cause of these complications.

There are certain precautions that one can and should take routinely for early detection and recognition of this complication. A daily urinalysis is of great importance. If red blood cells are present, the drug should be stopped immediately. The nonprotein nitrogen in the blood can be estimated or the concentration of the drug in the blood measured as a guide for further treatment. Of even greater importance is the measuring of the daily output of urine. Dr. E. K. Marshall [1] of Johns Hopkins University stressed the fact that many cases of hematuria and anuria have occurred in patients owing to neglect in maintaining the urinary volume and allowing it to decrease to as little as 500 cc. a day or less. Thompson [8] and many others have stressed the fact that the daily urinary volume of these patients should be between 1,200 and 1,500 cc. Physicians have frequently been warned to make regular blood counts on patients taking sulfonamide compounds, but it would seem more essential to examine the urine for volume, red blood cells, specific gravity and albumin.

In response to an inquiry I have an interesting observation from Dr. Leon Herman [1] of Philadelphia: "At the moment we have a most fascinating case here in the person of a doctor who has passed seventeen stones and has had prolonged hematuria, notwithstanding the fact that the last dose of sulfathiazole was in April. Strange to say, his blood continues to show a considerable amount of the drug." Of course this was with the use of sulfathiazole, but the same thing might conceivably occur with any sulfonamide preparation.

The cause of death was probably toxemia, since the urinary output was normal and the nonprotein nitrogen was only 29 mg. per hundred cubic centimeters of blood. This would apparently exclude the urinary tract as the cause of death. However, without anuria and other renal complications, this patient would most likely have recovered from the pulmonary infection.

CONCLUSIONS

1. Sulfadiazine, although widely thought to be less dangerous than sulfathiazole, has been shown in at least 2 instances to cause dangerous renal complications.

2. Any patient receiving a sulfonamide drug who has pain in the lower part of the abdomen, diminution of urinary output and hematuria should certainly be suspected of having ureteral obstruction from precipitation. Immediate ureteral catheterization should be done.

3. Heat seems to be the principal aid in dissolving these crystals.

4. Any patient receiving the drug should have daily urinary examinations done.

5. Dehydration and malnutrition seem to predispose to urinary complications.

6. I do not question the therapeutic effectiveness of sulfadiazine but wish to call attention to complications that many have thought would hardly occur with this drug.

188 South Bellevue Street.

5. Personal communication to the author from Dr. Burbidge of Sharp & Dohme.

6. Spence, H. M.: Hematuria; Renal Colic and Complete Anuria Following Administration of Sulfapyridine, Brit. J. Urol. **13:** 16-20 (March) 1941.

7. Schwartz, Leon; Flippin, H. F.; Reinhold, J. G., and Domm, A. H.: The Effect of Alkali on Crystalluria and Sulfathiazole and Sulfadiazine, J. A. M. A. **117:** 514-515 (Aug. 16) 1941.

8. Thompson, G. J.: Proc Staff Meet., Mayo Clin. **16:** 609-612 (Sept. 24) 1941.

ELECTROCUTION BY HOME TREATMENT DEVICE

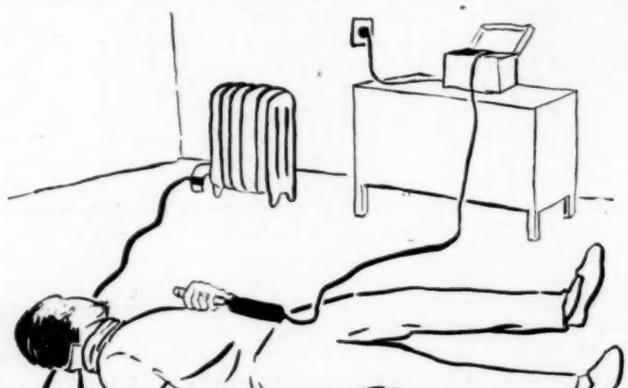
RICHARD KOVACS, M.D., NEW YORK

"Electric Shock Kills Pastor" was the caption of a story in the New York *Times* of Feb. 20, 1942. The Rev. L. G. W. of a Long Island Universalist Church was found dead in his room the night before. According to information obtained from the office of the chief medical examiner of Nassau County he was found lying on the floor of his bedroom, fully clothed except for his coat. A metal electrode was on the back of his neck, slipped under the collar and held in place with a scarf. A wire led from the electrode to the radiator and was wired to the radiator. A rheostat was plugged in a wall socket, the handle of a "violet ray" machine was on the deceased's chest and a circular hollow piece of metal was in his left hand, as illustrated in the accompanying sketch.

The pastor had complained of pain in the back of his neck for some time, but neither the landlady nor an osteopath who had given him a few treatments could supply any other facts.

Autopsy performed by the medical examiner showed acute congestion of the brain, liver and kidneys, follicular hyperplasia of the spleen and first degree burns of the left hand, forearm, back of the neck and anterior portion of the chest.

To reconstruct the sequence of events, the deceased undoubtedly attempted to treat his back pain with the violet ray contraption and, in the mistaken belief that "grounding" would



Electrocution from violet ray apparatus.

increase the strength of the current and thus the efficiency of treatment, after plugging in the handle of the violet ray outfit, rigged the connection between the radiator and the metal plate on the back of his neck. No better way could have been devised to conduct the alternating current from the return ground through the cardiac area. Hence, as soon as the current flow was started, it caused local burns at the point of entry and at the same time cardiac fibrillation and instantaneous death, without giving the victim any chance to disengage himself from the fatal circuit. Cardiac fibrillation is the usual cause of death in electrocution; because of its very short duration before death ensues there occur usually no characteristic pathologic changes in the heart itself. The acute congestion in the vital organs is a secondary effect of death by electricity as in asphyxiation.

The object lesson of this tragic happening is obvious. Any sort of self treatment by electric devices—home made or procured from unscrupulous manufacturers or their sales agents—may cause death by electrocution when applied by inexperienced and unskilled lay persons.

2 East Eighty-Eighth Street.

Doing a Great Favor.—When the faculty of a medical school realizes that a student is indifferent and lacks zeal and that that student is liable to become a tragic figure in the profession, they are doing the public, as well as the profession, a great favor by asking him to withdraw and enter some other field of activity.—Sproule, Ralph P.: A Doctor Speaks to Students, *Marquette M. Rev.* **5**:1 (Nov.) 1940.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

AUSTIN E. SMITH, M.D., Acting Secretary.

TEN PER CENT SOLUTIONS OF SODIUM MORRHUATE OMITTED FROM N. N. R.

For some time the Council has recognized the use of solutions of sodium morrhuate as a sclerosing agent for the injection treatment of varicose veins, and both 5 per cent and 10 per cent solutions in combination with a local anesthetic, marketed in ampuls and rubber stoppered vials by several pharmaceutical concerns, have been accepted for inclusion in New and Nonofficial Remedies.

Late in 1940 a physician brought to the attention of the Council office the serious results which had occurred in 5 cases following the injection of a Council accepted brand of the 10 per cent solution for treatment of varicose veins in the lower extremites and submitted for examination samples of the product that had been used in these cases. The physician explained that injection of a 5 per cent solution from previous orders had caused no difficulty in similarly treated patients. With the last batch purchased, however, injection of the 10 per cent solution in 5 cases produced fatal results in 2 and unfavorable symptoms in the other 3. One of the deaths occurred a few days after incision for a severe suppurative phlebitis which followed an injection of 2 cc. of the solution into the internal saphenous vein some distance above a suppurating ulcer. The patient was previously twice injected for infected suppurative veins. Death (which occurred after the third injection) was attributed to thrombophlebitis and septic pneumonia from small pulmonary septic thrombi. The other death occurred in a robust man of about 50 (who had had an injection of the 5 per cent solution some months before) within twenty-five minutes after injection of 2 cc. of the solution into the internal saphenous vein. About four minutes after the injection the patient became dizzy and short of breath. After eight minutes he became comatose and extremely cyanotic. Death was attributed to a large pulmonary embolism. In neither of the two fatalities was permission obtained for an autopsy to establish the cause of death. In the 3 nonfatal cases severe acute localized phlebitis developed with redness and extreme tenderness at the site of injection of the solution: in 2 of these recovery was uneventful; in the third case it was necessary to open the vein and express the apparently sterile clot. The quantity of the 10 per cent solution of sodium morrhuate which was injected in the 3 cases in which recovery occurred was not indicated. The physician expressed the belief that, in view of the previously satisfactory use of the 5 per cent solution, the accidents were due to the stronger solution. That death from pulmonary embolism may occur following sclerosing therapy for varicose veins, in the presence of acute or subacute phlebitis, was recently pointed out by Nunn and Harrison[1] in a brief review of the literature.

Examination of the submitted samples of the solution by the A. M. A. Chemical Laboratory revealed that they conformed to the N. N. R. standards of composition and supported the manufacturer's observation that the accidents were not attributable to chemical or bacteriologic defects in the 10 per cent solution. Accordingly, the Council's referee questioned whether there is need for the 10 per cent solution of sodium morrhuate and whether there is evidence to indicate that it will confer any benefit which a 5 per cent solution cannot accomplish. In the absence of published definite evidence concerning the utility or safety of the 10 per cent solution, the firm's offer to conduct a survey of the opinions of authorities on sclerosing therapy of varicose veins, to afford an answer to the referee's question, was accepted. The results of this survey have now

1. Nunn, L. L., and Harrison, J. H.: Death from Pulmonary Embolism Following the Injection of Varicose Veins, J. A. M. A. **117**: 347 (Aug. 2) 1941.

been submitted to and considered by the Council. It was the consensus of the authorities who have had experience with both the 5 per cent and 10 per cent concentrations of sodium morrhuate solution that the 10 per cent solution (which is used relatively infrequently) may be potentially more toxic than the 5 per cent solution and that, when the latter is inadequate, additional surgical measures should be instituted rather than the employment of a stronger solution.

In its consideration of the 10 per cent solution, attention was also directed to reports which have been published concerning reactions following injection of the 5 per cent solution for varicose veins. Praver and Becker [2] have reported untoward reactions in the form of cutaneous eruptions in 7 of 176 patients who received a total of seven hundred and eighty-three injections of this solution. Most of the reactions consisted of grouped urticarial wheals at sites of previous injection and were attributed to sensitization with the sodium morrhuate. The amount of protein present was considered too small to account for this, but the authors suggested that sodium morrhuate may act as a haptene. Lewis [3] observed that mild localized urticarial rashes are fairly common and reported a case of temporary collapse following the injection of this solution (after a previous similar injection), which he attributed to constitutional anaphylaxis through the development of foreign protein sensitivity. Dale [4] has reported the sudden development of vertigo, faintness, bradycardia resembling heart block and cyanosis of the extremities without manifestation of anaphylactic phenomena following an injection of the 5 per cent solution in a case in which similar injections had previously been made repeatedly. He questioned the validity of sensitization as the explanation for Lewis's case on the ground that the symptoms were not anaphylactic in nature and that there was no period of cessation of treatment during which the patient could have become sensitized. He considered the reaction as specific and attributed it to idiosyncrasy.

McCastor and his associates [5] reported a similar case of collapse following a single injection of the 5 per cent solution in a case in which a similar injection without reaction had been made five days previously. There was a previous history of urticaria. In a recent symposium on varicose veins at the Mayo Clinic, Smith, Weisman, McCallig, Heyerdale and others [6] indicated the successful use of the 5 per cent solution in the patients treated by their group. The use of a preliminary test dose is recommended, with observation for twenty-four hours before proceeding with treatment to avoid possible untoward reactions.

These reports not only tend to throw some light on the nature of the reactions which have occurred with sodium morrhuate but indicate the need for reasonable caution in its use as a sclerosing agent. After due consideration of the available information, the Council voted to omit all accepted brands of the 10 per cent solution of sodium morrhuate because of its questionable utility and greater toxic potentialities over the 5 per cent solution and because serious accidents have followed the use of the stronger solution for the injection treatment of varicose veins. The Council authorized a revision of N. N. R. to include a recommendation for the use of a preliminary test dose as a precaution against untoward reactions with 5 per cent solutions. The manufacturers whose Council accepted solutions of sodium morrhuate were affected by this action were accordingly informed, and all concerned have agreed to withdraw the 10 per cent solution from the market in view of its greater potential danger.

2. Praver, L. L., and Becker, S. W.: Sensitization Phenomena Following Use of Sodium Morrhuate, J. A. M. A. **104**: 997 (March 23) 1935.

3. Lewis, K. M.: Anaphylaxis Due to Sodium Morrhuate, J. A. M. A. **107**: 1298 (Oct. 17) 1936.

4. Dale, M. L.: Reaction Due to Injection of Sodium Morrhuate, J. A. M. A. **108**: 718 (Feb. 27) 1937.

5. McCastor, J. T. N., and McCastor, Mary C.: Reaction to Sodium Morrhuate Injections for Varicose Veins and Hydrocele, J. A. M. A. **109**: 1799 (Nov. 27) 1937.

6. Smith, F. L.: Type of Treatment Used at the Clinic for Varicose Veins, Proc. Staff Meet., Mayo Clin. **16**: 820 (Dec. 24) 1941. Weisman, R. E., and Heyerdale, W. W.: The Use of a Preliminary Test Dose and the Technic for Injection of Varicosities of the Lower Extremities, ibid., p. 821. McCallig, J. J., and Heyerdale, W. W.: Diagnosis of Varicose Veins of the Lower Extremities, ibid. p. 824. Heyerdale, W. W., and Stalker, L. K.: The Management of Varicose Veins of the Lower Extremities, ibid., p. 827.

DEXTROSE SOLUTIONS WITH BUFFERS OMITTED FROM N. N. R.

Sterile solutions of dextrose-U. S. P., 50 per cent w/v in combination with buffer substances such as sodium and potassium phosphate or sodium citrate (or packaged with a separate ampul of buffer solution for mixing) to render them less acid have been included in New and Nonofficial Remedies for several years. The Council accepted preparations of this type have been marketed by six different pharmaceutical manufacturers in ampuls containing amounts up to 100 cc. for intravenous injection. Three of these concerns also market similar solutions of dextrose which are not buffered or packaged with a buffer solution. In view of this and the well established successful use of unbuffered sterile solutions of dextrose intravenously, in both small and large quantities, the manufacturers of the accepted buffered preparations were requested to furnish evidence to justify the need or value for the addition of buffers to solutions of dextrose: they were advised that unless they could offer such evidence their buffered solutions of dextrose would not be recommended for reacceptance.

The replies received from the firms that attempted to support their buffered dextrose solutions advanced as the principal arguments the claim that buffers are added to avoid excessive acidity and that there is a demand for the buffered preparations. One concern indicated that the buffers serve to stabilize the solution and another that they render the solution isotonic with the blood. The other firms either offered no comments or indicated that they had no evidence to support the inclusion of buffers in solutions of dextrose. None of the concerns gave any reason why it was necessary to supply both buffered and unbuffered solutions of dextrose beyond the argument that they are in demand. The arguments which were advanced were answered by pointing out that the A. M. A. Chemical Laboratory has expressed the opinion (with concurrence of the Council) that the degree of acidity developed in unbuffered dextrose solutions is not clinically significant, that unbuffered solutions may remain stable over a period of three years and that buffers are added for the purpose of altering the p_H of the solution rather than for any direct influence on the tonicity (osmotic pressure) of the solution. Recently, in its consideration of a further brand of dextrose solution which was buffered, the Council indicated that when a buffer is needed for intravenous administration, as in disturbances of acid-base balance, it should be given separately in the form of Lactate-Ringer's solution or sodium *r*-lactate one-sixth molar (1.87 per cent w/v).

It is furthermore not altogether clear whether the dextrose solutions are buffered primarily for the purpose of stabilization or to render the p_H of the solutions approximately the same as that of the blood. In either case the need for buffers in solutions administered to supply fluid or physiologic salts or carbohydrate is not supported by past experience. The buffering mechanism of the blood itself is apparently adequate to take care of relatively large volumes of moderately acid or alkaline solutions which are commonly administered intravenously. The use of buffers to control the p_H of solutions should be clearly distinguished from the practice of adjusting the concentration of ingredients in solutions to make them isotonic with the blood in order to avoid damage to the cellular elements. Even the tonicity factor is commonly ignored when it is desired to administer hypertonic solutions for the purpose of causing dehydration of the patient.

All the firms have agreed to make their buffered solutions of dextrose acceptable by elimination of the buffer in the formula or of the buffer solution packaged with the dextrose solution or to withdraw them from active promotion, except Eli Lilly and Company. This concern has admitted that it has no evidence to support the addition of buffers to dextrose solutions, but, on the ground that there is a demand from the trade for its buffered preparations, it will continue to market them.

The Council voted to discontinue the acceptance of all brands of dextrose solution with buffers and to omit them from N. N. R. because of the lack of evidence for buffering dextrose solutions.

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SATURDAY, JUNE 6, 1942

ACTIVE IMMUNIZATION AGAINST TYPHUS

Typhus is an invariable accompaniment of war and famine. Although accurate information on typhus in this war is not yet available, it seems to be increasing in the Balkans, Spain, Poland and the regions about the Russo-German fronts. There are rumors that the disease is spreading in Germany from infected soldiers, though the claim is made that the menace has been banished from Germany.[1]

Ever since the recognition of Rickettsia prowazeki as the causative agent, attempts have been made to develop a vaccine suitable for the large scale active immunization of exposed populations. Numerous preparations obtained from human beings, guinea pigs, lice, mice and fleas have been tried. However, today the field has largely narrowed—as far as is known outside of Russia or Germany—to three methods of producing typhus vaccine: Weigl's louse intestine vaccine, Castaneda's mouse or rat lung vaccine and Cox's yolk sac vaccine.

Weigl [2] attempted active immunization by using the phenolized intestinal contents of lice infected by rectum with R. prowazeki obtained from the brains of infected guinea pigs. The technic of injection is difficult. Since two or three hundred lice are necessary to provide sufficient vaccine for one person, large scale immunization is difficult. However, these vaccines, composed of killed rickettsias, have been found protective for experimental animals. Although the results have been reported as less satisfactory in man, Weigl's vaccine seems to have been clinically valuable as employed in Poland,[3] Slovakia [4] and Ethiopia.[5]

Castaneda's [6] mouse or rat lung vaccine, prepared from a Mexican murine strain, can be produced in reasonable quantity. Experimentally this vaccine seems to produce a high degree of immunity. Castaneda has also shown that the vaccine, when prepared from an endemic strain, will protect against infection by the classic strain of European typhus. Dyer,[7] commenting on Castaneda's vaccine, admits that it has been shown to protect man against subsequent inoculation with infectious material, but he points out that neither this vaccine nor the others have yet been thoroughly tested under controlled conditions in the presence of a typhus epidemic.

The most generally favored vaccine is that prepared by Cox [8] from the growth of rickettsias in the yolk sac of developing chick embryos. By this method pure suspensions of rickettsias may be obtained from the yolk sac of infected eggs by centrifugation. Inactivation may be accomplished by the addition of phenol and solution of formaldehyde. Vaccine sufficient for 25 or 30 persons can be obtained from 14 embryos—a practicable quantitative result.[9] The potency of this type of vaccine is usually tested by injecting intraperitoneally at weekly intervals three doses of 1 cc. each into guinea pigs. This serves to protect guinea pigs against 1,000 to 10,000 infective guinea pig doses of R. prowazeki in the form of infected guinea pig brain. The complicating effect of this course of vaccination on the Weil-Felix reactions and neutralizing antibodies of human beings on whom it has been employed may be due, in part at least, to the size of the dose. However, the only large scale trial of this method of vaccination has been in Spain by Rockefeller Foundation workers. Unfortunately their departure in 1941 did not allow a sufficient period of observation for evaluation of the results. Many more have been inoculated since then. Spanish observers believe it has helped to control the spread of the disease.

Little is now known concerning the incidence of typhus or the means attempted toward active immunization in any of the other countries most likely to be involved. The Germans are said to be employing a vaccine the nature of which is uncertain. Whether this is restricted to use in Germany or is also used in the Balkans and Poland is not known. Almost certainly the Russians are employing various methods to control the spread of typhus, but whether or not this includes active immunization, what vaccine is employed and what the results have been to date are not known outside that country.

The War Department of the United States has issued a directive [10] to the effect that all military personnel stationed or traveling through areas in which there is

1. Public Health Under Hitler's Rule, Foreign News, J. A. M. A. **119:** 359 (May 23) 1942.
2. Weigl, R.: Ueber aktive Fleckfieberimmunität, Med. Klin. **20:** 1046, 1924; Arch. Inst. Pasteur de Tunis **22:** 315, 1933.
3. Radlo, P.: Arch. Inst. Pasteur Afr. N. **26:** 667, 1937.
4. Drbohlav, J.: Bull. Off. Int. Hyg. Publ. **30:** 317, 1938.
5. Mariani, G.: Ann. Igiene (sper.) **49:** 316, 1939.
6. Castaneda, M. R.: Active Immunization Against Epidemic Typhus by Means of Vaccines Prepared from Endemic Virus, Brit. J. Exper. Path. **22:** 167 (June) 1941.
7. Dyer, R. E.: Mass Immunization Against Typhus Fever, Ann. Int. Med. **15:** 629 (Oct.) 1941.
8. Cox, H. R.: Use of Yolk Sac of Developing Chick Embryo as Medium for Growing Rickettsiae of Rocky Mountain Spotted Fever and Typhus Groups, Pub. Health Rep. **53:** 2241 (Dec. 23) 1938.
9. Cox, H. R., and Bell, E. J.: Epidemic and Endemic Typhus: Protective Value for Guinea Pigs of Vaccines Prepared from Infected Tissues of the Developing Chick Embryo, Pub. Health Rep. **55:** 110 (Jan. 19) 1940.
10. Vaccination Against Typhus Fever, Cholera and Plague, War Med. **2:** 139 (Jan.) 1942.

danger from epidemic typhus are to be immunized with typhus fever vaccine prepared by the Cox yolk sac culture method. The initial vaccination is to consist of three injections of 1 cc. each, administered subcutaneously at weekly to ten day intervals. Subsequent vaccinations of a single 1 cc. dose are to be administered every four to six months as long as serious danger of infection is present, and other single doses may be given whenever in the opinion of the surgeon this additional stimulation of immunity is indicated.

The value of typhus vaccination has not yet been definitely established. One of the major difficulties has been the lack of a suitable experimental animal, though the eastern cotton rat may prove to be such an animal.[11] Adequate controlled clinical trial is also necessary and this too is lacking. Pending acceptable information of this nature, none of the vaccines available in this country can be considered acceptable for routine mass administration. The War Department recommendations seem sound; other preventive measures involve satisfactory diets, avoidance of overcrowding and the maintenance of an adequate, trained personnel and mobile delousing equipment for use in emergencies.

11. Fosdick, R. B.: The Rockefeller Foundation—A Review for 1941.

THE HERITAGE OF CONNECTICUT MEDICINE

The Connecticut State Medical Society is celebrating its one hundred and fiftieth anniversary. Again medical history has been enriched by the publication of a volume commemorating the occasion. The Connecticut State Medical Society was granted a charter in May 1792 after representative practitioners tried for nearly thirty years to convince the legislators that it would be in the public interest. The originator of the idea for a formal medical organization in Connecticut is not known. However, the New Haven County Medical Society still has the minutes of every meeting held since Jan. 5, 1784. The first volume of medical transactions issued in this country was published by the Medical Society of New Haven in 1788 in a report of observations on 26 cases by various practitioners. Colonel Leverett Hubbard, the first president of the state society, also commanded the second regiment of militia from 1773 to 1775. "The peaceful laurels to be won in a daily routine of calomel, ipecac and bark were not sufficient for his ardent temperament." Mainly through the efforts of pastors a collegiate school was established at Saybrook in 1701, which after its transfer to New Haven developed into Yale College.

Poorly trained practitioners were numerous, and charlatanry was rife. Ezra Stiles, Yale's president, believed that the teaching of medicine was an obligation of his college. He obtained the advice of physicians in planning a medical curriculum but did not live to see it realized. Timothy Dwight, the next president of Yale, consulted with the Connecticut State Medical Society in the development of plans for a medical school. Nathan Strong, a minister, induced the Yale corporation to appoint a committee to look into the possibilities of establishing medical professorships and to confer with the Connecticut State Medical Society. The plan was adopted and presented by the joint committees to the legislature, which in 1810 empowered the state medical society to join with Yale in forming the "Medical Institution of Yale College." In the next autumn thirty-seven medical students presented themselves for instruction.

Thomas Lord of Hartford was the first physician licensed to practice by the general court, which also established a fee table: "For visit to any house in Hartford, 12 pence; in Windsor, 5 shillings; in Farmington, 6 shillings." Dr. Bryan Rosseter seems to have performed the first recorded necropsy in Connecticut about 1662. He was voted twenty pounds by the general assembly for "opening Kellies child," who in her delirium, possibly the result of bronchopneumonia, had cried out against a local witch. To Dr. Jared Eliot, who was also a preacher, the church offered sixty cords of firewood a year if he would marry, which he promptly did. Of his eleven children, three became physicians. Dr. Eliot, who was the first graduate of Yale to be elected a trustee of the college, in his will, left "ten pounds of lawful money, the interest of which shall be applied to the use of the library," and that was the beginning of the Yale Library fund. Of Dr. John Winthrop Jr., governor of Connecticut for many years, the historian has written "He was the finest flower of New England aristocracy." Among other famous practitioners were Samuel Mather Jr., Alexander Wolcott and Elisha Perkins, whose announcement of the "discovery" of the Perkins metallic tractors in 1775 to the Connecticut Medical Society was received "with doubt and caution" and by some members "even with contempt." Dr. Elisha North was one of the first advocates of vaccination and the first in this country to open an eye infirmary. Dr. Elihu Hubbard Smith of Hartford belonged to a group called "the Connecticut Wits," which started the first real literary movement in America. He was preeminent also in editing the first medical journal published in this country, and he composed an opera in three acts, which was produced in 1794. Dr. Smith died of yellow fever in the great epidemic of 1798. Dr. William Beaumont, the young army surgeon and pioneer American physiologist, was born in Lebanon, Conn. The list of great names in American medicine could be lengthened down the years by many additions from Connecticut, including Drs. William Henry Welch and William H. Carmalt.

In this interesting anniversary volume, the development of physiology, public health, surgery, psychiatry and medical licensure in Connecticut is reviewed. Connecticut's sesquicentennial celebration came to a climax

in the meeting at Wesleyan University in Middetown, June 3-4, under the presidency of Dr. James Douglas Gold. Wednesday morning was given over entirely to clinical medicine by the various sections. Wednesday noon there was a president's luncheon and in the afternoon a meeting, before which "Medicine of the Present and the Future" was discussed. On Thursday morning the historical meeting was attended by the governor of Connecticut, the president of Wesleyan University and the mayor of Middletown. Addresses were delivered by Dr. Howard W. Haggard of Yale University on "Connecticut Colonial Medicine" and by Drs. Creighton Barker and Stanley B. Weld, executive secretary and editor, respectively. The convocation on Thursday afternoon was attended by the chairman of the Board of Trustees of the American Medical Association, Dr. Arthur W. Booth of Elmira, N. Y., and was addressed by Dr. Logan Clendening of the University of Kansas School of Medicine, on "Opposition to Change as a Contribution to Social Progress." The Connecticut State Medical Society exercised its ancient privilege at this meeting of conferring honorary degrees of medicine on Dr. Alice Hamilton and Dr. Yandell Henderson. The speaker at the anniversary dinner Thursday evening was the President-Elect of the American Medical Association, Col. Fred W. Rankin, M. C., U. S. Army.

Thus was celebrated the 150th anniversary of the fourth state medical society to be established in America and the third to have had continuous existence since its founding. Among many others, much credit is due to the sesquicentennial committee, of which the chairman was Dr. George Blumer; the vice chairman, Dr. Herbert Thoms; chairman of the historical program, Dr. David R. Lyman; of public relations, Dr. C. Charles Burlingame; of historical exhibits, Dr. Arthur H. Jackson; of the scientific program, Dr. Francis G. Blake; of the local arrangements and annual dinner, Dr. Roy L. Leak.

Current Comment

EVERY DRUGSTORE A VENEREAL DISEASE FIRST AID STATION

Philadelphia pharmacists, in a statement [1] signed by several Pennsylvania physicians and pharmaceutic leaders, are being urged, in effect, to utilize their stores as prophylactic stations against venereal disease. The drugstore is often the social center of a neighborhood. It is suggested that the socially minded head and personnel of such establishments can "(*a*) discourage off-color frequenters looking for pick-ups and trouble; (*b*) give friendly advice and even sober counsel to some who are obviously on the way to going wrong; (*c*) urge blood tests and medical examination on persons who are known to have exposed themselves." The pharmacist is an educator, and the corner druggist's establishment can be as much of a center for public health as a physician's office, hospital or the health department in the city hall. The pharmacist behind the counter has the first chance to give or sell prevention to persons who may expose themselves to venereal disease, to give or sell prevention to persons who have been exposed already, and "to sell the basic idea of a prompt accurate diagnosis and immediate treatment" to persons who describe a symptom or ask for treatment, attempt to purchase a proprietary remedy, tell a story that shows they are taking risks that they do not realize, or that they have consulted a quack. The pharmacist is urged to place the facts and aims of venereal disease control before the public, and the state pharmaceutic association is prepared to supply a card or posters for counter display and booklets for distribution to inquirers.

1. Stokes, J. H.; Everhart, E. S.; Ingraham, N. R., Jr.; Fetter, Theodore; Griffith, Ivor; Hughes, J. J., and Woodside; J. M.: The Help of the Pharmacist in Venereal Disease Control: A Statement.

KOCH'S CANCER TREATMENT MEETS THE LAW: II

A Current Comment in THE JOURNAL, April 18, called attention to the fact that the Koch Laboratories in Detroit and the concern's principals "will face charges of violating the Federal Food, Drug and Cosmetic Law on 11 specific charges." Now comes word that the Federal Trade Commission has also entered the picture. At the time of the Wheeler-Lea Amendment to the Federal Trade Commission Act there was some conjecture as to whether or not it was advisable to have the advertising which was a part of the package come under the purview of the Food and Drug Administration, and all collateral advertising—newspapers, magazines, utterances by radio and mailing—under the purview of the Federal Trade Commission. In this particular instance there is no question as to its advisability. Reproduced herewith is a release of the Federal Trade Commission which requires no further comment:

TEMPORARY RESTRAINING ORDER

Medicines, Friday, May 22, 1942

Judge O'Brien, of the United States District Court for the Eastern District of Michigan, Detroit, today (May 22) granted a temporary restraining order upon application of the Federal Trade Commission, requiring William F. Koch, Louis G. Koch, and Koch Laboratories, Inc., 8181 East Jefferson Ave., Detroit, to cease disseminating false advertisements concerning medicinal preparations designated "Glyoxylide," "B-Q," and "Malonide Ketene Solution."

The defendants are required to show cause on May 27 why a preliminary injunction should not be issued without bond to restrain them from disseminating the advertisements alleged pending issuance of a complaint against them by the Federal Trade Commission and until its final disposition.

The temporary restraining order of the court requires the two individuals and Koch Laboratories, Inc., until May 27, to cease advertising that Glyoxylide is a competent or effective preparation for use in treating any type or stage of cancer, arteriosclerosis, dementia praecox, epilepsy, tuberculosis, septicaemia, insanity and other ailments; that "B-Q" is effective for use in treating any infection including gonorrhea, sinusitis, meningitis, infantile paralysis, streptococcus sore throat, pneumonia, and other diseases; and that Malonide Ketene Solution is effective for treatment of allergic diseases, infections, diabetes, cancer, double pneumonia, or post operative meningitis.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

TWENTY-EIGHT MILLION SURGICAL DRESSINGS MADE BY RED CROSS WORKERS

Between the beginning of September 1939 and the 1st of October 1941 the American Red Cross spent $49,753,515 on war relief in Europe, Asia and the Middle East. This sum does not take into account the medical, surgical and hospital supplies—estimated at a value of $200,000—shipped to Russia from Great Britain in behalf of the American Red Cross.

The relief work thus accomplished during the past twenty-five months of the war has been made possible by gifts from the American people and by supplies purchased by the United States government for foreign war relief. Volunteer workers in American Red Cross chapters have played a large part in this work. According to the League of Red Cross Societies they have produced nearly six and a half million articles of clothing and 28,331,772 surgical dressings. These workers have furnished Great Britain alone with 21,786,000 dressings, 565,000 hospital garments, 1,630,000 sweaters, 879,000 other knitted garments, 1,459,000 children's garments, 511,000 articles of clothing for women, 253,000 layettes and 39,000 women's kits. More than eleven hundred thousand blankets have been sent to various countries for the wounded and for homeless civilians.

MEDICAL DEPARTMENT OPENS NEW SCHOOL

A new school devoted entirely to the training of medical administrative corps officers was opened on May 9 at Camp Barkeley, Texas. Lieut. Col. G. E. Armstrong, assistant commandant under Brig. Gen. Roy C. Heflebower, camp commander, will have direct charge of instruction. Major Charles L. Driscoll of the medical administrative corps now at Fitzsimons General Hospital, Denver, will be assigned to the new school, as will be the following as heads of departments: Capt. Wayne A. Starkey, M. C., medical tactics; Capt. August H. Groeschel, M. C., training; Capt. William H. Crosby Jr., M. C., chemical warfare; Capt. Francis B. Elder, S. C., military sanitation; 2d Lieut. Richard B. Quigley, Medical Administrative Corps, logistics. Other schools under the supervision of the medical department are (1) the Army Medical School, Washington, D. C., which trains officers in military medicine, (2) the School of Aviation Medicine, Randolph Field, Texas, which trains flight surgeons, and (3) Medical Field Service School, Carlisle Barracks, Pa., which trains medical department officers in field work and military duties.

CIVILIAN DEFENSE

Dr. John B. Alsever, formerly of Syracuse, N. Y., and now of Washington, D. C., arrived in San Francisco, April 27, to assist Dr. Leonard A. Scheele, regional medical officer of the Office of Civilian Defense, in setting up blood banks in Pacific Coast hospitals.

Dr. Arthur E. Lewis of Seattle, assistant state medical officer for civilian defense, returned from Cincinnati, April 27, where he took a course in chemical warfare. Dr. Lewis will speak throughout the state to Emergency Medical Service units, defense coordinators and in hospitals. Dr. Donald G. Evans, state chief of the Emergency Medical Service, in cooperation with the state defense council, is creating medical areas throughout Washington so that smaller communities may draw on the large cities for medical supplies and personnel in case of air raids.

At nine mass meetings in Tacoma, Wash., April 27, sufficient contributions were made by citizens to equip the ten emergency hospitals which have been located in the public schools. The Red Cross had already equipped the twenty-seven casualty stations in Tacoma, which also are located in school buildings.

Dr. Herman N. Bundesen, Chicago, chief of the Emergency Medical Service for Civilian Defense, announced on May 11 that Mayor Kelly had appointed the following eleven doctors as district medical adjutants for the Chicago metropolitan area: Warren H. Cole, loop; Lester R. Dragstedt, south side; John A. Wolfer, north side; Frederick A. Besley, Waukegan; Frederick Christopher, Evanston; Sumner L. Koch, Des Plaines; Frederick G. Dyas, Wheaton; James H. Skiles, Cicero; Eli S. Jones, Gary; Charles F. Sawyer, Harvey, and Harry A. Oberhelman, Oak Park.

INDIANA'S GENERAL HOSPITAL UNIT

Special ceremonies were held on May 12 at the James Whitcomb Riley Hospital, Indianapolis, in recognition of the 32d U. S. Army General Hospital unit formed at Indiana University Medical Center. Already forty-two physicians and five dentists have received their commissions. When completed, there will be attached to the 32d General Hospital unit about seven hundred persons, including one hundred and twenty nurses. Drs. Cyrus J. Clark and Charles F. Thompson, both of Indianapolis, who have been in charge of organizing the unit, have been commissioned lieutenant colonels.

At the ceremony were Governor Henry F. Schricker, Mayor Reginald H. Sullivan, President Herman B. Wells of Indiana University, William L. Bryan, president emeritus, and Dr. W. D. Gatch, dean of the university medical school, who presided. The military ceremony was conducted by Col. R. L. Shoemaker, commanding officer of the Indiana University R. O. T. C., and the oath of loyalty was administered by Lieut. Col. I. F. Peak, commander of the medical school R. O. T. C. In the first world war Base Hospital No. 32 was organized at Indiana University Medical School in cooperation with the City Hospital and the American Red Cross.

COMMISSIONS FOR DENTAL AND VETERINARY STUDENTS

The War Department, Washington, D. C., April 17, granted authority to corps area commanders to waive the provisions of paragraph 5, AR 140-33, for the appointment as second lieutenant, Army of the United States (Medical Administrative Corps), of physically qualified male citizens of the United States above the age of 18 years who are bona fide accepted matriculants at approved dental and veterinary schools within the United States. Officers so appointed will not be ordered to active duty until eligible for appointment as first lieutenant, Army of the United States (Dental or Veterinary Corps).

Appointment will be made without reference to an examining board as prescribed in paragraph 20 *c*, AR 140-5, and without reference to procurement objectives.

Applications and accompanying papers as prescribed in AR 605-10 will be forwarded by the dean of the dental or veterinary school to the commanding general of the corps area in which the school is located, together with a certified statement that the applicant is a bona fide accepted matriculant in dentistry or veterinary medicine at the institution.

Officers appointed under these provisions will be discharged for the convenience of the government under the following cir-

cumstances: (1) discontinuance of dental or veterinary education; (2) matriculation at an unapproved school of dentistry or veterinary medicine; (3) failure to complete successfully the prescribed four year course of dental or veterinary instruction; (4) failure to secure appointment in the Army of the United States (Dental or Veterinary Corps) within three months after completion of the prescribed four year course of dental or veterinary instruction.

Students at approved schools of dentistry and veterinary medicine who already hold reserve commissions in other arms or services will not be ordered to active duty until they successfully complete the prescribed four year course of dental or veterinary instruction. In the latter event they may be transferred to the Dental or Veterinary Corps Reserve in the grade of first lieutenant.

SOCIETY OF MEDICAL DEPARTMENT OFFICERS AT FORT DEVENS

The Fort Devens Society of Medical Department Officers will be addressed, June 16, by Dr. Alan Moritz, professor of legal medicine, Harvard Medical School, Boston, on "Observations on the Pathology of Mechanically Produced Injuries." The society was addressed, June 2, by Dr. Ernest E. Tyzzer of Harvard Medical School on "Tropical Medicine"; May 19, by Lieut. Col. William F. McPhee, chief of the surgical service of the second evacuation hospital, on "Pilonidal Sinus," and, May 5, by Dr. Herman C. Pitts of Providence, R. I., on "Treatment of Cancer of the Cervix." This organization meets on the first and third Tuesday of each month and is attended by the medical department officers stationed at Fort Devens. The society was organized in 1939.

MEDICAL COLLEGE OF VIRGINIA HOSPITAL UNIT

U. S. Army General Hospital Unit No. 45, formed at the Medical College of Virginia, Richmond, has been ordered to report at a camp for training preparatory to service abroad. When completely organized, the unit will include seventy-two medical and technical personnel from the staff of the Medical College of Virginia, a corps of enlisted men furnished by the Army Medical Department and more than a hundred nurses. While most of the physicians and dentists are from Richmond, some are from Norfolk, Lynchburg, Roanoke, Fredericksburg, Petersburg and Scottsville. In charge of organization of the unit have been Drs. John Powell Williams and A. Stephens Graham, both of whom have been commissioned lieutenant colonels. During the first world war, Base Hospital No. 45 was organized at the Medical College of Virginia under the leadership of the late Dr. Stuart McGuire of Richmond, and that unit performed distinguished service on the battlefields of France.

BLOOD BANKS IN PENNSYLVANIA HOSPITALS

A survey of Pennsylvania hospitals discloses that there is a total reserve of blood and plasma sufficient for treatment of only 2,775 civilian casualties in an emergency, the State Defense Council has reported, according to an article in the Harrisburg *Telegraph*. Dr. Paul Dodds, chief medical officer, said that two hundred and eight hospitals of fifty beds or more from which replies were received in a blood survey included sixty-eight with reserves beyond their regular needs, twenty-one with banks but without emergency reserve and one hundred and nineteen not maintaining banks. Twelve large hospitals of two hundred beds or more are without blood banks.

REGISTRATION OF DISTRICT DOCTORS

The District of Columbia Procurement and Assignment Committee conducted the registration of all licensed physicians in the district, May 12, in order to determine the number available for military service and those available for the care of the civilian population in the district. The Office of Civilian Defense provided thirty-five clerks to conduct the registration, which was carried out at the building of the District Medical Society, 1718 M Street N.W. Some of the clerks also were stationed at the various hospitals in the district. The chairman of the committee is Dr. Francis X. McGovern. The registration was voluntary. Physicians who were out of town at the time were expected to register at the medical society office on their return.

RECEPTION SERVICE FOR RETURNED SOLDIERS AND SAILORS

Governor Green announced on May 15 that the state of Illinois is establishing a reception service for returned soldiers and sailors of the present war. He has instructed the director of public welfare to secure the names of all men released from the armed services, of whom about one hundred and fifty soldiers, most of whom are mentally ill, have already returned to the state. The division of veterans' service will get in touch with these returned men, guide them in securing medical and hospital services and proper allowances for disability, and assist in finding employment when such is possible.

NEW CHIEFS FOR HEALTH SUPPLIES BRANCH OF WAR PRODUCTION BOARD

Mr. Francis M. Shields, Miami Beach, Fla., formerly vice president of the American Optical Company, Southbridge, Mass., has been appointed chief of the Health Supplies Branch of the Division of Industry Operations of the War Production Board. Mr. William M. Bristol Jr., formerly chief of this branch, has resigned to rejoin his own company. Mr. Fred J. Stock, who has been associated with the Health Supplies Branch as an industrial commodity specialist, has been appointed deputy branch chief. He was formerly an official of the Walgreen Drug Company, Chicago.

EMERGENCY DISTRICT CENTERS IN SACRAMENTO

Nine district centers are now ready at Sacramento, Calif., to provide in an emergency everything from medical care to reuniting lost children with families, the Sacramento *Bee* reports. The centers function under the defense council, and one thousand men and women are ready to operate them. The centers will provide food, shelter, clothing, first aid, registration of the injured and emergency transportation. The centers go into action only in a major emergency when normal facilities for such services become inoperative. An educational campaign will be launched to acquaint the citizens with the locations of the nearest district centers.

DR. BOUSFIELD IN CHARGE OF HOSPITAL UNIT

Dr. Midian O. Bousfield, member of the Chicago Board of Education and for nine years director of Negro health under the Julius Rosenwald Fund, will leave on June 7, according to the Chicago *Sun*, to take charge of an all Negro medical and nursing unit which will provide the staff for an army hospital in a southwestern state. The personnel has been recruited largely from the Provident Hospital in Chicago. Among the other medical officers in the unit will be Majors Harold Thatcher, John West and Maurice Shaw, Capts. Arthur W. Thomas and Clarence Jamison and First Lieuts. Earl Shephard and Joseph Mitchell.

BLOOD BANKS IN WEST VIRGINIA

The state health commissioner, who is chief of the Emergency Medical Service in West Virginia, has appointed Dr. John W. Crosson to take charge of setting up blood banks in emergency base hospitals in strategic areas of the state and in Wheeling, Huntington and Charleston. To qualify, the hospitals must be approved and have at least a capacity of two hundred beds; when designated they may receive up to $2,000 to defray expenses of setting up blood banks.

ORGANIZATION SECTION

OFFICIAL NOTES

THE ATLANTIC CITY SESSION

Radio Program

Arrangements for radio broadcasts in connection with the annual session of the American Medical Association at Atlantic City have been completed.

The weekly dramatized program Doctors at Work on the network of the National Broadcasting Company will close with the broadcast scheduled for Saturday, June 13, at 5 p. m. eastern time.

In addition, the following programs have been scheduled for broadcasting by National Broadcasting Company and Columbia Broadcasting System networks, the Blue Network and local stations in Atlantic City (eastern time):

WFIL (Blue Network), Monday, June 8, 2 p. m. Dr. J. Harry Murphy, Omaha. Childhood type tuberculosis.

WBAB (C. B. S.), Monday, June 8, 4 p. m. Col. F. W. Rankin, M. C., U. S. Army, Louisville, Ky. "Your Doctor's Responsibilities in Wartime."

N. B. C., Tuesday, June 9, 12:30 p. m. Dr. Frank H. Lahey, Boston. "The Place of Medicine Today."

WBAB, Tuesday, June 9, 2:30 p. m. Dr. Irwin Schulz. Injuries in children.

WFPG, Tuesday, June 9, 7:45 p. m. Dr. Don Carlos Peete, Kansas City, Kan. Acute rheumatic fever.

WBAB, Wednesday, June 10. See local papers for time. Round table discussion "Doctors at War." Dr. George Baehr, Washington, D. C.; Dr. Willis S. Knighton, New York; Rear Admiral H. W. Smith, M. C., U. S. Navy, Washington, D. C.; Dr. Charles S. White, Washington, D. C., and Dr. W. W. Bauer, Chicago.

N. B. C., Thursday, June 11, 6:30 p. m. Dr. W. W. Bauer, Chicago. Convention news.

WFPG, Thursday, June 11, 7:45 p. m. Dr. Elmer H. Loughlin, Brooklyn. Pneumonia.

MEDICAL ECONOMIC ABSTRACTS

FEDERAL AND STATE AID

A rapid and far reaching centralization in financial administration in recent years is traceable to the accelerated growth in the amounts given by the federal government to the states and by the states to local governments.[1] In 1941 $851,000,000, or 10.7 per cent of the total federal revenues, was distributed in the form of aid. "Of this amount $744,000,000 was paid to states, $96,000,000 was paid to local governments and $11,000,000 to territorial governments."

This is a comparatively recent development in public finance. Although federal aid has been given for education, agriculture and highways for many years, the total amount of such aid distributed in 1925 was only $113,600,000. While federal aid for all the aforementioned purposes has increased, the most rapid growth has been in public assistance, which amounted to $155,000,000 in 1937 and to $331,000,000 in 1941. Under this classification $259,000,000 constituted aid to the aged.

The following sums were given to aid public health:

Crippled children	$ 5,071,000
Maternal and child health	3,739,000
Public health work	10,284,000
Venereal disease control	5,483,000
Total	$24,577,000

That this movement toward the centralization of finance is not confined to the federal government is evidenced by the increase in the aid given by states to local governments from $535,800,000 in 1925 to $1,697,800,000 in 1941. Education still receives the largest share of state aid, but public assistance has shown the most rapid growth in recent years. This is partly due to more extensive participation by the states in all forms of public assistance and especially to "payments for the categorical forms of public assistance—old age assistance, aid to dependent children and aid to the blind—which consist almost exclusively of unemployable people." In some states, of which Pennsylvania is an outstanding example, the state has taken over functions formerly performed by elected county officials so that the "county boards . . . are in reality state agencies working directly under the state department of public assistance."

1. Federal and State Aid: 1941, U. S. Department of Commerce, Jesse H. Jones, Secretary, State and Local Government, Special Study No. 19, April 1942.

FARM SECURITY PLAN IN OKLAHOMA

That there is considerable dissatisfaction with the working of the farm security plan for medical care is indicated in the report of the Committee on Medical Economics to the House of Delegates of the Oklahoma State Medical Association, which says:

"In the main, the reports from the different societies were to the effect that the programs were not satisfactory for reasons of administration, inequalities and low fee payments for services rendered.

"Upon meeting with F. S. A. representatives concerning this program, certain objectionable features seemed to have been eliminated, but your committee at this time cannot report further upon the attitudes of the county societies concerning the operations of the plans under the revised system.

"Your committee recommends that no endorsement of the Farm Security Administration plans be made by the House of Delegates, but that the cooperation of organized medicine be left to the discretion of the local county societies after careful and complete study."

EFFECT OF THE WAR ON CLINIC VISITS

An increase in employment accompanying the economic changes attendant on war activity is apparently responsible for a rapid decline in the number of visits to Milwaukee clinics. A report of the Milwaukee County Community Fund and Council of Social Agencies found that while there were nearly 128,000 such visits during the last quarter of 1940 there were only 91,000 in the corresponding months of 1941, a decline of over 25 per cent. The decline was 33 per cent in public and 12 per cent in private clinics.

Data for January and February 1942 indicate that the rate of decline is increasing for most of the clinics. In explanation of this trend the council says "In recent months, men have reentered industry who formerly were on relief or barely 'getting by.' Many families whose insufficient incomes qualified them for clinic care a year ago now have incomes which place them outside of the group entitled to health agency clinic care."

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Examinations to Fill Laboratory Positions.—The California State Personnel Board has announced that applications will be received from citizens throughout the United States for the position of chief, bureau of laboratories (entrance salary $360 a month), and assistant chief, bureau of laboratories (entrance salary $320 a month), in the state department of public health. The requirements for the position of chief are graduation from a college of medicine, five years' experience in a laboratory devoted to bacteriologic and chemical work, and ability to obtain a medical certificate in the state of California. The entrance requirements for the position of assistant chief are the equivalent of three years of graduate study in bacteriologic science and two years' experience in a public health laboratory in a biologic producing laboratory, in an educational institution laboratory producing, testing or analyzing biologic preparations or as a teacher of bacteriology in a university. Application forms and information may be obtained from the California State Personnel Board, 1015 L Street, Sacramento. Applications must be filed by June 30.

FLORIDA

Venereal Control Officer.—Dr. Wilson T. Sowder, Tampa, U. S. Public Health Service, who was health officer of Hillsborough County, has been placed in charge of the bureau of venereal disease control of the state board of health. He succeeds Dr. Leo C. Gonzalez, Jacksonville, who has been in charge of the work for the last four years and who, it is reported, was to retire on May 1 to engage in private practice in Tampa.

Annual Graduate Course.—The Florida Medical Association and the state board of health will conduct their annual graduate short course for doctors in medicine at the George Washington Hotel, Jacksonville, June 22-27. Included among the instructors will be Drs. Nicholson J. Eastman, professor of obstetrics, Johns Hopkins University School of Medicine, Baltimore; Edward W. Alton Ochsner, William Henderson professor of surgery, Tulane University of Louisiana School of Medicine, New Orleans, and Robert W. Wilkins, assistant professor of medicine at Harvard Medical School, Boston.

GEORGIA

Industrial Hygiene Service.—The Georgia State Department of Health recently created an industrial hygiene service in its division of preventable diseases with Dr. Lester M. Petrie, Atlanta, as director.

State Medical Election.—Dr. William A. Selman, Atlanta, was named president-elect of the Medical Association of Georgia at its annual meeting in Augusta, April 28-May 1, and Dr. James A. Redfearn, Albany, was inducted into the presidency. Other officers include Drs. Samuel J. Lewis, Augusta, and Cleveland Thompson, Metter, vice presidents. Dr. Edgar D. Shanks, Atlanta, was reelected secretary. The next annual meeting will be in Atlanta, May 11-14.

District Meetings.—The Seventh District Medical Society was addressed at Dalton, April 1, among others, by Drs. Hal M. Davison, Atlanta, on "Management of the Asthmatic Patient" and Frederick B. Ragland, Dalton, "Treatment of Abortions."——Dr. Seale Harris, Birmingham, addressed the Fifth District Medical Society in Atlanta, April 6, on "Endocrinopathies and Carbohydrate Metabolism."——The Eighth District Medical Society was addressed in Valdosta, April 14, among others, by Dr. Charles M. Carpenter, Rochester, N. Y., on "Community Control of Gonorrheal Infection."

ILLINOIS

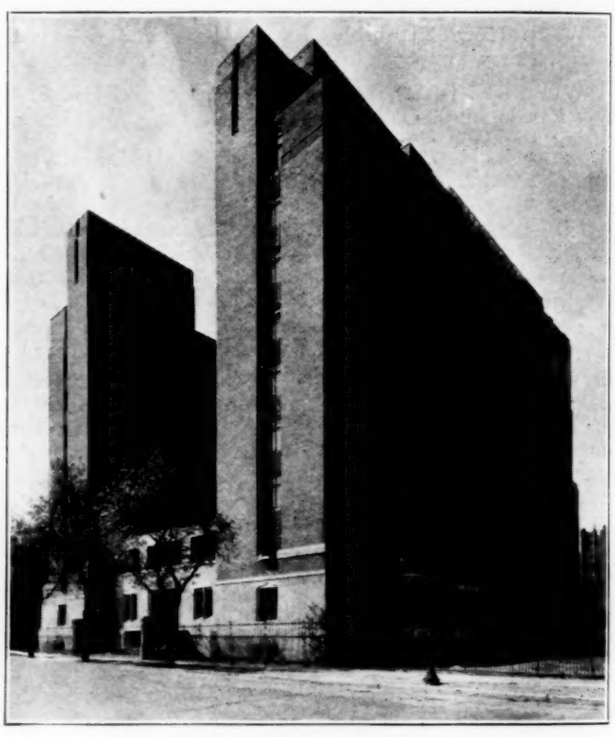
Changes in Health Personnel.—Dr. Reuben F. Reider, New York, U. S. Public Health Service, has been named health officer of the Champaign-Urbana health district, succeeding Dr. Walter C. Earle, Champaign, who has been granted a leave of absence to do special work for the federal government, it is reported.——Dr. Henry C. Scholer has been named health officer of Monmouth, succeeding Dr. James W. Firoved, who resigned to enter the medical corps of the navy.

Chicago

Reunion at Illinois.—The alumni-faculty-student smoker of the University of Illinois College of Medicine will be held June 11 at 6:30 p. m. at the Chicago Illini Union. Reservations may be made with the Medical Alumni Association, 1853 West Polk Street. Dr. Michael H. Streicher is the secretary.

Alumni to Dine with Last Class at Rush.—The alumni banquet of Rush Medical College will be held in the Red Lacquer Room, Palmer House, June 13, at 6:30 p. m. The occasion will mark the graduation of the last class of Rush Medical College. Dr. Morris Fishbein, Editor of THE JOURNAL, will deliver the principal speech, on "Military and Civilian Aspects of Medicine in War."

Neuropsychiatric Institute Dedicated.—The Illinois Neuropsychiatric Institute on the grounds of the Illinois Research and Educational Hospital is being formally dedicated, June 6. Dr. Harry R. Hoffman, executive officer, is presiding. Dr. Edward A. Strecker, professor and head of the department of psychiatry, University of Pennsylvania School of Medicine, Philadelphia, and president-elect, American Psychiatric Association, is delivering the principal address entitled "Neuropsychiatric Perspectives." Dr. Ralph C. Hamill will deliver a tribute to the late Willoughby G. Walling, chairman of the board of welfare commissioners, whose idea it was that the institute's facilities be available for teaching and research to all qualified medical schools in the state. A. L. Bowen, Springfield, will offer a tribute to the late Dr. Harold Douglas Singer. Other speakers will include Arthur Cutts Willard, LL.D., president of the University of Illinois, and Gov. Dwight H. Green, Springfield. Three bronze plaques will be unveiled and dedicated to the memories of Dr. Singer, the late Governor Henry Horner and Mr. Walling. The unit which was constructed as a joint project of the state department of public welfare and the University of Illinois, with the financial assistance of the PWA, cost more than $1,500,000. Dr. Francis J. Gerty was chosen by the university as director of the psychiatric division and Dr. Eric Oldberg as director of the neurologic and neurosurgical divisions. The institute is composed of three distinct but interrelated units. The north tower houses organic neurology; the south tower houses psychiatry; the air conditioned ground or basement floor contains the neurophysiologic unit. Each nine story tower is an independent hospital, research and teaching institute. The psychiatric tower has facilities for 98 patients, including those for 14 children. The children's ward will be directed by Dr. Paul L. Schroeder, who will have immediate charge of the conduct of treatment, research and teaching. The neurologic tower has a patient capacity of 54, including facilities for 3 infants and 9 children.



Illinois Neuropsychiatric Institute.

Portrait of Dr. H. Douglas Singer.—A portrait of the late Dr. Harold Douglas Singer, professor of psychiatry at the University of Illinois College of Medicine, was presented to the university at a memorial dinner in the Chicago Illini Union on May 27. Dr. Francis J. Gerty, head of the department of psychiatry, presided. A. L. Bowen, Springfield, former director of the state department of public welfare, gave the address of presentation. Dr. David J. Davis, dean of the medical school, delivered the address of acceptance, and the psychiatric staff under the chairmanship of Dr. Alfred P. Solomon presented a sketch "As We Knew Dr. Singer." The portrait was painted by Mrs. Lucile Stevenson Dalrymple from photographs. The cost was met by contributions from friends and associates. Dr. Singer was made director of the newly created Illinois State Psychopathic Institute in 1907. In 1917 he was appointed state alienist and was at the same time special examiner for the Illinois Exemption Board and advisory consultant in neuropsychiatry to the surgeon general of the U. S. Public Health Service. He was also advisory consultant to the U. S. Veterans Bureau. At the time of his death in 1940 he was president of the American Board of Psychiatry and Neurology, president of the American Neurological Association and president-elect of the American Psychiatric Association.

MAINE

State Medical Meeting.—The ninetieth annual session of the Maine Medical Association will be held at the Poland Spring House, Poland Spring, June 21-23, under the presidency of Dr. Penry L. B. Ebbett, Houlton. A tentative program lists the following speakers:

Rev. George W. Shepherd, Boston, The Battle for Freedom in China and India.
Dr. Joe V. Meigs, Boston, Endometriosis: Its Etiology, Symptoms and Treatment.
Dr. Howard T. Karsner, Cleveland (Subject not announced).
Dr. Merrill C. Sosman, Boston, Observations on Reversible Heart Disease.
Dr. Samuel C. Harvey, New Haven, Surgery of the Sympathetic System.
Dr. Chester S. Keefer, Boston, Differential Diagnosis of Obscure Cases.
Dr. Delmer Allan Craig, Bangor, Medical Aspects of Civilian Defense.

There will be conferences on traumatic surgery and other subjects. On Tuesday evening the annual banquet will be addressed by Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, on "Medicine and the War." Presentation of the fifty year medals will take place at this time.

MARYLAND

New Secretary of State Society.—Dr. William Houston Toulson, professor of genitourinary surgery, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, was chosen secretary of the Medical and Chirurgical Faculty of Maryland at the annual meeting, April 28-29, to fill the unexpired term of Dr. Richard T. Shackelford, Baltimore, who has entered army service. Dr. Robert Lee Hall, Pocomoke City, is president. It was also decided to cancel the semiannual meeting of the society, usually held in the early fall.

Personal.—Dr. Huntington Williams, commissioner of health of the city of Baltimore, who studied air raid medical administration in England for the Office of Civilian Defense, recently spoke on this subject at the annual postgraduate clinic at George Washington University School of Medicine, Washington, D. C.——Elsa Orent Keiles, Sc.D., formerly of the department of biochemistry, Johns Hopkins University School of Hygiene and Public Health, Baltimore, is now in charge of the nutrition research laboratories and assistant chief of the foods and nutrition division of the Bureau of Home Economics, U. S. Department of Agriculture, Beltsville Research Center, according to *Science*.

MICHIGAN

Graduate Work for Physicians.—The Michigan State Medical Society in cooperation with the Wayne University College of Medicine, Detroit, the University of Michigan Medical School, Ann Arbor, and the Michigan Department of Health, Lansing, has arranged a series of meetings to help practicing physicians keep abreast of recent developments in medicine. Weekly conferences made up the program in various places throughout the state. They opened in April and continued until the last week in May.

Past Presidents' Night.—The Bay County Medical Society marked its "past presidents' night," April 8, with a dinner honoring twenty-four physicians who formerly served as president. A gold key was awarded to each one. Dr. Charles H. Baker, president of the state medical society in 1919, who served as president of the county society in 1887, is dean of the group. Others at the dinner included Drs. William Kerr, Virgil L. Tupper, William R. Ballard, Roy C. Perkins, George W. Moore, Joseph C. Grosjean, Royston E. Scrafford, Aloysius J. Zaremba, Edward C. Warren, Paul R. Urmston, Vanny H. Dumond, Charles W. Ash, Matthew R. Slattery, Edward S. Huckins, John H. McEwan, Sylvester L. Ballard, Arthur D. Allen, Charles L. Hess, L. Fernald Foster, Robert H. Criswell, Relza N. Sherman, all of Bay City, Guy M. McDowell, Howell, and Maurice C. Miller, Auburn. Dr. Foster is now secretary of the state medical society.

NEW JERSEY

Diathermy Machine Seized in Alien Raid.—On May 23 newspapers reported that a short wave radio transmitter of the diathermy machine type, capable of transmitting messages 50 miles out to sea, was seized by Federal Bureau of Investigation agents in one of thirty-eight raids which they made the previous evening on the homes of aliens of enemy nationalities in different sections of New Jersey. The apparatus was found in the home of a 36 year old unmarried German, who said he bought the machine for use in treating rheumatism but admitted that he had never consulted a physician concerning such an ailment. The man was arrested. A recent order by the federal communications commissioner directs all owners of diathermy machines to register them with the commission by June 8.

NEW YORK

Hospital News.—A fifty-eight bed addition will be constructed to the St. Francis Hospital, Poughkeepsie, at an estimated cost of $298,000. About $100,000 will be available under a federal grant.

Scarlet Fever Traced to Raw Milk.—About thirty cases of milk-borne scarlet fever occurred between April 6 and April 20 among workers in a cheese plant in Delaware County or among persons using milk obtained from the plant. The bureau of milk of the state department of health is attempting to determine the origin of the infection. All the milk now used in the plant is being pasteurized prior to the processing of the cheese, whereas raw milk was largely used in the process prior to the outbreak.

New York City

Graduate Courses.—The New York University Graduate School announces the following courses as part of the regular twelve weeks summer session, June 29-September 18: biochemistry and nutrition (biology), hematology and microtechnic (biology), advanced laboratory technics (physics), semimicroqualitative organic analysis (chemistry) and organic synthesis (chemistry).

Merrit Cash Prize Awarded.—The Merrit H. Cash Prize of the Medical Society of the State of New York for "the best original essay on some medical or surgical subject" has been presented to Dr. Emanuel Goldberger for his paper on "The Value and Advantages of Augmented Unipolar Extremity Leads (aV—Leads) in the Diagnosis of Myocardial Infarction (Coronary Thrombosis and Acute Coronary Insufficiency)." The research on which the paper was based was conducted at Lincoln Hospital.

Changes in Faculty at Long Island College of Medicine.—Dr. Fred L. Moore has resigned as professor of preventive medicine and community health of the Long Island College of Medicine, Brooklyn, effective when his successor has been appointed. He has been named director of the division of public health studies of the Commonwealth Fund. The college of medicine announces the promotions of the following Brooklyn doctors to professional rank, effective July 1:

Dr. Edwin P. Maynard Jr., medicine.
Dr. George Freiman, ophthalmology.
Dr. Howard F. Beakey, medicine.
Dr. Martin A. Murphy, medicine.
Dr. Charles B. Jones, surgery.
Dr. Mortimer A. Lasky, ophthalmology.
Dr. Louis J. Frank, dermatology and syphilology.

Three Cents a Day Plan Benefits Increase.—The Associated Hospital Service has announced that the three cents a day plan benefits to member hospitals will be increased from the present rate of $6.75 to $7 per day of hospital care received by subscribers on or after July 1. The increase, which is subject to the approval of the state departments of insurance and social welfare, was voted in recognition of the rising cost of hospital service. The present rate of $6.75 a day has been in effect since Oct. 1, 1941, when it was increased from the

former daily payment of $6.50. The Associated Hospital Service also announces that seventy hospital boards with their medical staffs and more than two thousand four hundred individual physicians are now participating in the Community Ward Plan, the new prepayment plan for low income workers which is jointly sponsored by Associated Hospital Service and Community Medical Care, Inc.

Annual Graduate Fortnight.—"Disorders of the Nervous System" will be the theme of the fifteenth graduate fortnight of the New York Academy of Medicine, October 12-23. The program will include morning panel discussions, afternoon hospital clinics, evening lectures, scientific exhibits and demonstrations. Evening lectures will be delivered by:

Dr. Timothy Leary, Boston, Pathology of Head Injuries.
Dr. Derek E. Denny-Brown, Boston, Principles of Treatment of Closed Head Injuries.
Dr. William V. Cone, Montreal, Quebec, Canada, Principles of Treatment of Penetrating and Perforating Wounds of the Brain.
Dr. Eli Jefferson Browder, Brooklyn, Subdural Hematoma (and Other Late Results of Head Injury).
Dr. Edward A. Strecker, Philadelphia, Military Psychiatry.
Dr. Harold G. Wolff, The Emotions and Disease.
Dr. Donald Munro, Boston, Tidal Drainage and Cystometry in the Treatment of the Bladder in the Presence of Spinal Cord Injuries.
Dr. Joseph E. J. King, Diagnosis and Treatment of Brain Abscess.
Dr. Gilbert Horrax, Boston, Differential Diagnosis and Prognosis of Brain Tumors.
Dr. Frank B. Walsh, Baltimore, Neuro-Ophthalmology.
Dr. Byron P. Stookey, Wounds and Injuries of the Spinal Cord.
Dr. Francis C. Grant, Philadelphia, Surgical Treatment of Pain.
Dr. Stanley Cobb, Boston, Treatment of Speech Disorders.
Dr. Tracy J. Putnam, Multiple Sclerosis and "Encephalomyelitis."
Dr. Charles D. Aring, Cincinnati, Limitations of Vitamins in Neurology.
Dr. Nolan D. C. Lewis, Present Status of Shock Therapy.
Dr. Walter Freeman, Washington, D. C., Prefrontal Lobotomy.
Dr. Lawrence S. Kubie, Types of Psychotherapy and Indications for Them.
Dr. Henry A. Riley, Migraine and Other Forms of Headache.
Dr. William G. Lennox, Boston, Epilepsy and Its Treatment.

OHIO

Personal. — Dr. Robert M. Andre, Waverly, has been appointed supervisor of the medical section of the state industrial commission during the absence of Dr. Henry P. Worstell, Columbus, now on active duty as a lieutenant commander in the medical corps of the U. S. Navy. Dr. Addison L. Kefauver has been named assistant supervisor of the medical section. ——Dr. Barbara A. Hewell, pediatric coordinator of the Cincinnati Anti-Tuberculosis League, has resigned to become specialist in child hygiene in the division of research in child development in the U. S. Children's Bureau, Washington, D. C.——Dr. Harold O. Crosby, Findlay, coroner of Hancock County, was guest of honor at a dinner given by the county medical society on April 14 to mark his departure for army service. He was presented with a gladstone bag and a traveling clock.

Traveling Exhibit on "Food for Health."—The Cleveland Health Museum announces its first traveling exhibit on "Food for Health." Nine units are included in the exhibit: The "Wheel of Life" reveals in essential part protective foods; "How Many Calories" is an exhibit which shows the varying quantities of food needed for work and play; "Why We Eat" illustrates food elements necessary to various parts of the bodily structure; "Food Building Blocks" are especially for elementary class room nutrition. The exhibit "A Nickel's Worth" shows variance of return on money spent for wholesome foods rather than luxury foods and drinks. Twelve food fallacies are illustrated. An exhibit shows how to get double food value for prices which the average buyer pays. The foods are demonstrated in average servings in colored wax models, and most of them have their own individual lighting. Dr. Bruno Gebhard is director of the Cleveland Health Museum.

OKLAHOMA

Long Memorial Lecture.—Dr. Charles W. Mayo, Rochester, Minn., recently delivered the third LeRoy Long Memorial Lecture at the University of Oklahoma School of Medicine, Oklahoma City, under the auspices of the Phi Beta Pi fraternity. Dr. Mayo's subject was "Principles of Surgery of the Colon."

Spring Clinical Conference.—The Pottawatomie County Medical Society recently held an annual spring clinical conference at the Aldridge Hotel, Shawnee. Dr. Arthur E. Hertzler, Halstead, Kan., spoke on "Surgical Aspects of Acute Conditions of the Gallbladder" and Dr. Andrew C. Ivy, Chicago, "The Physiology of the Gallbladder." In the evening Dr. Hertzler discussed "The End Results of Total Thyroidectomy" and Dr. Ivy "The Physiology of the Thyroid Gland."

OREGON

Change in Meeting Place. — The Oregon State Medical Society will hold its annual session in Portland instead of in Corvallis. The change was made because of the probable inadequate hotel accommodations resulting from increased need of housing facilities. The meeting will be held September 9-11.

PENNSYLVANIA

Personal.—Staff members of the Braddock General Hospital, Braddock, gave a dinner recently to honor Dr. Harry F. Fisher, Braddock, for his completion of fifty years in the practice of medicine. Dr. Fisher is chief obstetrician and oldest member of the hospital staff.

Society News. — Dr. Herbert T. Kelly, Philadelphia, addressed the Lehigh County Medical Society in Allentown, May 12, on "Nutrition as It Appears to General Disease."—— Dr. I. Newton Kugelmass, New York, discussed "War Nutrition for Children in Health and Disease" before the Cambria County Medical Society in Johnstown recently.

Pittsburgh

Psittacosis Reported. — Two cases of psittacosis were reported in Springdale on May 5, according to the Pittsburgh *Telegram*. The disease occurred in two neighbors, aged 68 and 38.

Society News. — Dr. Charles B. Huggins, Chicago, addressed the Pittsburgh Urological Association, May 1, on "Endocrine Relationship of Prostatic Carcinoma." —— Dr. Joseph Stokes Jr., Philadelphia, discussed "Studies on Active Immunization Against Measles" before the Pittsburgh Pediatric Society on April 24.——Among others, Drs. Louis W. Statti, Pittsburgh, addressed the Pittsburgh Ophthalmological Society, April 27, on "Pentothal Sodium Anesthesia in Ophthalmology" and Edmund B. Spaeth, Philadelphia, treatment of chronic dacryocystitis.

VIRGINIA

Federal Grant to Assist in Hospital Expansion. — A grant of $695,880 by the Federal Works Agency to King's Daughters' Hospital, Portsmouth, will finance the addition of a four story wing, providing one hundred and thirty additional beds, it is reported. The grant will also provide a new nurses' home and complete equipment.

State Conference of Social Work.—The program of the medical and health section of the Virginia State Conference of Social Work in Richmond, April 24-25, included a morning session devoted to the recent trial of the United States versus the American Medical Association in Washington. Mr. John H. Lewin, special assistant, attorney general's office, and Mr. Seth Richardson, counsel for the American Medical Association, presented a discussion. Mr. Watson B. Miller from the Federal Security Agency's Office spoke on "Federal Plan for Extending Health in Medical Services." All are of Washington, D. C.

New Dean at Medical College.—Dr. Jacques P. Gray, director of the Hillsdale County (Mich.) department of health, Hillsdale, under the auspices of the W. K. Kellogg Foundation, has been appointed professor of preventive and public health medicine and dean of the Medical College of Virginia, Richmond, effective July 1. Dr. Lee E. Sutton Jr., who has been dean at the medical school since 1932, will continue as professor of pediatrics. Dr. Gray graduated at Johns Hopkins University School of Medicine, Baltimore, in 1928. At one time he served as director of public welfare of San Francisco County and lecturer in public health, University of California, Berkeley.

Changes in Health Personnel.—Dr. Daniel Hope Jr., Lawrenceville, formerly assistant health officer of the Brunswick-Greenville-Mecklenburg health district, has been appointed health officer of the Alleghany-Botetourt health district, with offices in Covington, succeeding Dr. Wyatt E. Roye, Covington, who has been transferred to the tuberculosis outpatient service of the state health department at Richmond. Dinwiddie County has joined with Sussex-Prince George counties as a health district under Dr. Francis J. Clements, Stony Creek, health officer.——Dr. Wallace E. Baker, Petersburg, has been appointed assistant epidemiologist in the division of venereal disease control of the state department of health. Dr. William E. Chapin, Richmond, has been named to succeed Dr. Baker in his former position of field epidemiologist for the Camp Lee area with headquarters in Petersburg.——Dr. Beverly L. Holladay, Wytheville, has resigned as health officer of Wythe County, effective April 1.

WYOMING

State Society Meeting in August.—At a special meeting of the council of the Wyoming State Medical Society in Cheyenne, April 20, it was decided to hold the 1942 annual session in Cheyenne, August 16-18.

WASHINGTON

Meeting of Obstetricians.—Dr. David H. Houston, Seattle, was chosen president of the Washington State Obstetrical Association at its meeting in Seattle, April 18, succeeding Dr. Richard S. Mitchell, Wenatchee. Dr. Robert H. Stewart, Seattle, was named vice president, and Dr. Henry H. Skinner, Yakima, was reelected secretary-treasurer. Dr. Robert D. Mussey, Rochester, Minn., was the guest speaker, on "Hypertension in Pregnancy" and "Endometriosis."

GENERAL

Golf Prizes for Specialists.—Nine silver pitchers have been presented by members of the "old guard" in the American Medical Golfing Association to be won by players representing each specialty during the annual golf tournament at the Seaview County Club in Atlantic City, N. J., June 8. These prizes are in addition to the numerous other prizes announced in THE JOURNAL, May 2, page 47.

Russian Memberships Conferred on Americans.—The Russian Academy of Science, Moscow, has elected to honorary memberships three Americans and two Britons, the first foreigners to be so honored since the revolution, according to the New York *Times*, May 10. The Americans are Dr. Walter B. Cannon, George Higginson professor of physiology, Harvard Medical School, Boston; Ernest O. Lawrence, Ph.D., professor of physics and director of the Radiation Laboratory, University of California, Berkeley, and Gilbert Newton Lewis, Ph.D., since 1912 professor of chemistry and dean of the college of chemistry at the University of California. The Britons are Sir Henry H. Dale, M.D., physiologist, and John B. S. Haldane, F.R.S., professor of biometry, University College, London.

Reduction in Potency of Digitalis.—Examinations of a number of samples of each of the various pharmaceutic forms of digitalis indicate that a substantial reduction in potency will result in changing from U. S. P. XI to U. S. P. XII standards. The exact reduction is not predictable, but data indicate that the reduction will amount to 40 per cent or more in at least half of the cases. In a drug in which standardization is as important as with digitalis, a change in potency of this magnitude is of the greatest interest to the physician and the patient. In a statement to manufacturers of digitalis preparations, W. G. Campbell, commissioner, Food and Drug Administration, suggests that during the transition period in which U. S. P. XI and U. S. P. XII products may both be available, conspicuous notice of the reduction in potency be given on the labels.

Committee to Direct Morale.—The American Psychiatric Association appointed a committee at its annual meeting in Boston, May 21, to "present forcefully to the authorities in Washington the need for a greater use of psychiatry in the armed forces and for the maintenance of civilian morale." Members of the committee are Drs. Arthur H. Ruggles, Providence, R. I.; Edward A. Strecker, Philadelphia, and Frederick W. Parsons, New York. A program seeking to obtain "the emotional adjustment of the nation as a whole by teaching school children the laws of social and mental hygiene" was outlined by Drs. Mesrop A. Tarumianz, Farnhurst, Del., director of mental hygiene clinics of Delaware; Persis F. Elfeld, Wilmington, assistant director, and H. Edmund Bullis, Wilmington, executive director of the Delaware State Society for Mental Hygiene.

Special Society Elections.—Dr. Eli K. Marshall Jr., Baltimore, was chosen president of the American Society for Pharmacology and Experimental Therapeutics at its annual meeting recently. Other officers include: Drs. Carl A. Dragstedt, Chicago, vice president; Raymond N. Bieter, Minneapolis, secretary, and Erwin E. Nelson, New Orleans, treasurer. The next annual session is planned for the first week in April in Cleveland.——The American Institute of Nutrition elected the following officers at its meeting in Boston, April 1: Leonard A. Maynard, Ph.D., Ithaca, N. Y., president; Howard B. Lewis, Ph.D., Ann Arbor, Mich., vice president; Arthur H. Smith, Ph.D., Detroit, secretary; Dr. William H. Sebrell Jr., Washington, D. C., treasurer.

Warning of Impostor.—A middle aged man giving the name of Henry Calvin Van Dycke (or Van Dyke) has been victimizing laboratory workers, particularly biochemists and bacteriologists. He pleads exhaustion of funds, asks for temporary work, accepts loans of money. He claims to have a Ph.D. in chemistry from the University of Leyden and to have studied at Oxford and Bonn. He claims to have inherited wealth from his Dutch father and Scotch mother but to have lost it in 1939, and to have served as a volunteer worker in various scientific laboratories, especially in and around San Francisco. Recently he has been "working" around New York and Baltimore. He is about 60, is 5′ 7″ tall, weighs 150 pounds. His clothes are good, his manners excellent, his English is perfect save for a somewhat guttural accent. He can converse in French, German or Dutch and has a knowledge of history, art, mathematics and scientific methods. His laboratory technic shows excellent training. He has made claims of working with reputable men and institutions in this country, none of which have been found to be true, according to reliable reports. This matter has been placed before the Federal Bureau of Investigation and the New York Police Department. Should he approach physicians for funds or employment, they should notify local police authorities.

American Gynecological Society.—The sixty-seventh annual meeting of the American Gynecological Society will be held at Skytop Lodge, Skytop, Pa., June 15-17, under the presidency of Dr. William C. Danforth, Evanston, Ill. Included among the speakers will be:

Dr. George W. Kosmak, New York, The Gynecologic and Other Implications Which Relate to an Aging Female Population.
Dr. John I. Brewer, Chicago, Studies of the Human Corpus Luteum: Evidence for Early Regression of the Corpus Luteum.
Dr. Willard M. Allen, St. Louis, The Effect of Progesterone in Adolescent Girls and Young Women with Functional Uterine Bleeding.
Dr. Edward G. Waters, Jersey City, N. J., Selective Hysterectomy for Nonmalignant Uterine Disease.
Dr. Daniel G. Morton, San Francisco, Observations on the Development of Pelvic Conformation.
Dr. Kyle B. Steele, New York, The Classification of the Obstetrical Pelvis, Based on Mensuration and Morphology.
Dr. Andrew C. Ivy, Chicago, The Functional Anatomy of Labor with Special Reference to the Human.
Dr. Franklin F. Snyder, Chicago, The Experimental Production of Toxemias of Pregnancy.

The annual dinner of the society will be held on Tuesday, June 16, at 8 p. m.

Registration Under Harrison Narcotic Act and the Marihuana Tax Act.—On or before July 1, every physician registered under the Harrison Narcotic Act or under the Marihuana Tax Act, or under both, must reregister with the collector of internal revenue of each district in which he maintains an office or a place for the treatment of patients. Failure to reregister within the time allowed by law adds a penalty of 25 per cent to the annual tax payable at the time of registration and in addition makes the physician in default liable to a fine not exceeding $2,000 or to imprisonment for not exceeding five years or to both. In recent years the Commissioner of Internal Revenue has given some negligent or recalcitrant physicians the choice between paying substantial sums by way of compromise in lieu of the penalties for their offenses or, as an alternative, accepting criminal prosecution with resultant publicity and liability to fines and possible imprisonment. This was an act of grace on the part of the commissioner; he might have instituted criminal prosecutions without allowing the offending physicians any choice in the matter. If the course that the commissioner has adopted does not produce the desired promptness in registration, he will have no recourse other than criminal prosecution to attain that result.

First Fellowship Under Lawrason Brown Fund.—Mr. Henry Clark Jr., Scotland Neck, N. C., who was a student at the University of Rochester School of Medicine, New York, has been designated the first fellow under the Lawrason Brown Memorial Fund. Mr. Clark, who became ill with tuberculosis at the end of his third year (1939-1940) and was treated at Trudeau Sanatorium, Saranac Lake, will carry on research on the influence of anesthesia on respiration in healthy and tuberculous patients. The fund was established by friends of the late Dr. Lawrason Brown to finance one or more fellowships for research in diseases of the chest. The selection of the fellows, preferably those who have recovered from tuberculosis, is made by a committee, comprising Drs. Leroy U. Gardner, Saranac Lake; Louis Hamman, Baltimore; Esmond R. Long, Philadelphia; David R. Lyman, Wallingford, Conn.; James Woods Price, Saranac Lake, and William P. Thompson, New York. The fund is managed by the Saranac Lake Society for the Control of Tuberculosis. Should this society at any time cease to exist, the management of the fund shall be offered

first to Johns Hopkins University and then to another competent organization selected by the unanimous vote of the memorial committee. The establishment of the fund was announced late in 1940 and now stands at more than $31,000. The original goal was set at $50,000.

Northwest Medical Association.—The twentieth annual session of the Pacific Northwest Medical Association will be held at the Hotel Multnomah, Portland, Ore., June 17-20. The speakers will include:

Dr. Anton J. Carlson, Chicago, Our Inadequate Criteria of Health; The Machinery of Appetite for Foods; What is the Matter with the American Diet, and Some Unknowns in the Physiologic Pathology of Aging.

Dr. Arlie R. Barnes, Rochester, Minn., Pulmonary Embolism; Changing Concepts of Coronary Artery Disease and Electrocardiographic Abnormalities in Various Types of Heart Disease.

Dr. Jerome W. Conn, Ann Arbor, Mich., Nature of Obesity and Its Management; Spontaneous Hypoglycemia: Changing Concepts of Diabetes Mellitus.

Dr. Elmer L. Sevringhaus, Madison, Wis., Diagnostic and Therapeutic Problems Associated with the Menopause; The Use of Pituitary Preparations in the Treatment of Dwarfism and of Sex Retardation and Survey of Endocrine Preparations in Therapy by the General Practitioner.

Dr. Warfield M. Firor, Baltimore, The Treatment of Tetanus and the Use of Tetanus Toxoid; Treatment of Wounds Involving Soft Parts and Intestinal Antisepsis with Sulfonamides.

Dr. Frederic E. Templeton, Chicago, Mucosal Relief Technic for the Roentgenologic Examination of the Esophagus, Stomach and Duodenum; Correlation of Roentgenologic and Gastroscopic Methods in Diagnosis of Gastric Disease and Roentgenologic Aspects of Esophageal, Gastric, Duodenal and Jejunal Ulcer.

Lieut. Comdr. Daniel W. Wheeler, U. S. Navy Medical Corps, Bremerton, Wash., Physiologic Aspects of War Injuries.

Lieut. Comdr. Lawrence R. Gowan, U. S. Navy Medical Corps, Bremerton, Psychiatric Aspects of Military Disabilities.

Brig. Gen. Lewis B. Hershey, U. S. Army, Washington, D. C., American Medicine and the War.

Col. Paul W. Gibson, U. S. Army Medical Corps, Vancouver, Wash., The Doctor as a Medical Officer in the Army.

HAWAII

New Society of Clinical Pathologists.—The Hawaii Society of Clinical Pathologists was recently organized in Honolulu with Drs. Carl F. Tessmer, Honolulu, president, and Irvin L. Tilden, Puunene, secretary-treasurer. The first regular meeting was addressed by Dr. Eric A. Fennel, Honolulu, who discussed the development of pathology in Hawaii during the last twenty years and Drs. Isaac A. Kawasaki, Abram S. Benenson and Philip P. Green, all of Honolulu, "A Consideration of Common Diarrheal Diseases of Bacterial Origin."

LATIN AMERICA

Personal.—Dr. Edgar D. Adrian, professor of physiology, Cambridge University, Cambridge, England, is giving a series of lectures under the auspices of the British Council in Buenos Aires, according to *Science*.

Urologic Meeting.—The Mexican Urological Association met in annual session in Mexico City, May 11-14. Among the speakers were Drs. Hugh H. Young, Baltimore, William F. Braasch, Rochester, Minn., and Robert Guiterrez, New York, who have been elected honorary members of the association.

FOREIGN

Hadassah University Pharmacological Institute.—The establishment in Palestine of a pharmacologic institute for clinical research and a pharmaceutic laboratory for the extraction of vitamins, hormones and allied substances has been announced by the Women's Zionist Organization of America, Inc., to be known as the Hadassah-University Pharmacological Institute. Scientists associated with the Hebrew University and the Rothschild-Hadassah-University Hospital, both of which are situated on Mount Scopus outside of Jerusalem, will be jointly responsible for the project. A. Geiger, now head of the laboratory of general physiology of the Hebrew University, will have charge of the pharmaceutic program. The Hebrew group, which last year was granted priority space free of charge by the British War Relief Society and the British Ministry of Shipping on all vessels leaving this country for Palestine, has been sending consignments in different products to supplement shortages which have already developed. It is hoped that the new laboratory will work out methods to develop and encourage the pharmaceutic industry as far as possible with local raw materials.

Deaths in Other Countries

Sir Thomas Oliver, M.D., London, authority on industrial diseases, died on May 16 at Newcastle, aged 89. He was former president of the University of Durham College of Medicine, Newcastle, a consulting physician of the Royal Victoria Infirmary, Newcastle, and former medical expert of the Dangerous Trades Committee of the Home Office. He was delegate of the Australian Commonwealth International Labor Conference at the League of Nations in 1921 and honorary president of the International Congress of Accidents and Industrial Diseases at Geneva in 1931.

CORRECTIONS

Professional Dentistry in American Society.—In a review of this book in THE JOURNAL, May 2, page 114, the second sentence in the review should not have been placed in quotations and it should have read: The period of professional awakening, 1820-1840, is discussed with respect to the establishment of medical schools and the rise of medical journalism.

Medical Recruiting Boards.—In the list of twenty-seven medical recruiting boards published in THE JOURNAL, May 16, page 271, the Ohio board should have been as follows: Major H. S. Perry of the Adjutant General's Department and Capt. Clarence E. Northrup, M. C., representing the medical department. Captain Northrup was erroneously listed as on the Indiana board. The names as published in THE JOURNAL were taken from the *Army and Navy Journal* of May 2.

Government Services

Dr. Pelouze Named Consultant in Gonorrhea Program

Dr. Percy S. Pelouze, assistant professor of urology, University of Pennsylvania School of Medicine, Philadelphia, has been appointed consultant for the gonorrhea control program with the U. S. Public Health Service. His first field assignment was to the state of North Carolina.

Annual Report of Veterans Administration

During the year ended June 30, 1941 there were 187,374 admissions of U. S. veterans to hospitals, an increase of 4 per cent over those for 1940 and the highest for any fiscal year to date, according to the annual report of the Administrator of Veterans' Affairs. The hospital load at the end of the year was 58,417 as compared with 56,841 in the previous year, an increase of about 3 per cent. The neuropsychiatric load increased 1,509 while the tuberculosis load decreased 19. At the close of the year 78.53 per cent of the U. S. veterans under hospitalization were receiving treatment for disabilities not of service origin. Of the total patient load 52,088 were World War veterans, Spanish-American War 2,992, Civil War 15, all other wars, expeditions and occupations 66 and regular establishment 2,999. Of the patients at the close of the year, 8.02 per cent were under treatment for tuberculosis, 59.14 per cent for neuropsychiatric diseases and 32.84 per cent for general medical and surgical conditions.

During the year 251,293 patients were under hospitalization, of whom 246,777 were United States veterans. The total number treated represents an increase of about 5.5 per cent over 1940. Of the group treated 188,617 were discharged after an average of 73.8 inpatient days. Deaths in hospitals totaled 12,891.

At the end of the year the Veterans Administration was operating hospital facilities at ninety-one locations in forty-five states and the District of Columbia with a capacity of 61,849 beds, an increase of 2,212 over the number available on July 1, 1940. In addition, the administration was using 2,570 beds in other government hospitals. There were 18,747 beds set aside for domiciliary care. On completion of new construction under progress in June of this report there was a combined total of 86,171 beds of all types for beneficiaries of the Veterans Administration.

The net operating expense for all hospital and domiciliary facilities controlled by the administration totaled $61,113,968.86. The per diem cost of operation for all types of cases was $2.78. A total of 1,111,589 outpatient physical examinations were made and 1,176,685 outpatient treatments furnished. Two per cent of the examinations and 9 per cent of the treatments were dental.

During the year a new chest surgery center was established in the facility at Livermore, Calif., supplementing the centers already in operation at Castle Point, N. Y., Oteen, N. C., Legion, Texas, Tucson, Ariz., and San Fernando, Calif. A fever therapy clinic is being organized at Northport, L. I.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 18, 1942.

The Rations of Enemy Prisoners

A revised scale of rationing for enemy prisoners has come into force. Excepting those employed in working parties the foodstuffs issued will be limited to the quantities allowed to British troops employed on sedentary duties. Working parties will continue to receive the normal home service ration, but modified to meet the taste of the nationals concerned. In working parties the Germans will get 6 ounces of meat daily and the Italians 4 ounces. But the Italians will receive 16 ounces of bread daily compared with the Germans' 10 ounces, and 16 ounces of potatoes against 13 ounces for the Germans. The Germans' ration of sausage or offal will be three issues of 4 ounces weekly; the Italians will get none. Both will receive daily 1½ ounces of margarine, 1⅔ ounces of bacon, 4⅞ ounces of cheese, 1 ounce of jam, 2 ounces of sugar, 1⅞ ounces of coffee, 3 ounces of condensed milk and 5⅝ ounces of fresh vegetables. Prisoners not in working parties receive daily 2⅓ ounces of meat, ⅔ ounce of margarine, ⅓ ounce of bacon, 2⅞ ounces of cheese, 1⅓ ounces of sugar, 32 ounces of potatoes and 5⅝ ounces of fresh vegetables. Italian prisoners will get 1¼ ounces of tobacco weekly.

Cross Infection in Hospital Wards

In the Section of Epidemiology of the Royal Society of Medicine a discussion on cross infection in hospital wards was opened by Dr. Robert Cruickshank, who defined cross infection as infection of a patient with the causal agent of a disease other than that for which he had been admitted. This definition included both manifest and latent infection. Persons might be cross infected with other biologic types of the organism responsible for the primary infection, e. g. in streptococcic, pneumococcic and diphtheritic infections. An example was a streptococcic cross infection rate of over 50 per cent in a measles ward, in which two thirds of the patients were clinically infected and one third latently. More than 60 per cent of the complications in scarlet fever were due to cross infection. The streptococcus was the arch enemy, but staphylococcic infections in infant nurseries, outbreaks of infantile diarrhea and cross infection with the diphtheria bacillus in scarlet fever and measles wards were too frequent.

Cruickshank divided cross infection into three forms: respiratory or inhalational, intestinal or ingestion, and contact or implantation. More attention should be given to the air as the vehicle for the spread of respiratory infections. For the control of cross infection the reservoirs must be attacked and the channels blocked. Sulfonamide derivatives were proving useful, and sprays might be used more frequently for the streptococcic throat. Patients should cover their coughs and sneezes with a handkerchief, masks should be more freely worn by nurses, and convalescents must not be allowed to come in contact with the sick. Infected dust was a major problem in hospital wards and should be prevented by oiling bed linen and clothes. Search for carriers had proved valuable in the control of outbreaks of Flexner and Sonne dysentery.

Dr. R. H. Dobbs said that in children's wards the solution was threefold: (1) hospital design with admission cubicles, small ward units and adequate isolation accommodation; (2) alertness to detect infection in new admissions and in the ward; (3) isolation of suspected or manifest infection, bacteriologic search for carriers, passive or active immunization against measles, diphtheria and scarlet fever.

Dr. N. D. Begg dealt mainly with gastroenteritis and streptococcic infections in infectious disease hospitals. In a London hospital patients admitted with enteritis were nursed in completely separate cells, feeds were prepared in a special room and the full technic of an isolation block was used. In two years among 390 admissions there were only 3 instances of secondary infection.

Danger of Famine and Pestilence

A conference on scientific problems in the postwar reconstruction of peasant agriculture in Europe, arranged by the British Association for the Advancement of Science, has taken place. The chairman, Sir John Russell, director of the Rohamstead agricultural experiment station, said that the Germans as they were expelled from the occupied countries would do damage that would stagger humanity and leave behind only famine and pestilence. Diseases of malnutrition, tuberculosis, malaria and typhus would be rife. The task of reconstruction would be difficult, and large scale relief imperative. As an integral part of the relief measures, we must get the agriculture of each country going, so that food would be produced on the spot, especially milk and the protective foods necessary to save children from growing into deformed men and women. Plans could be made with more certainty than in some other directions. The peasants would need seeds, animals, food for animals, implements for cultivation, cottages, stables and other buildings for animals.

Mr. Kenneth G. Brooks of the Society of Friends said that the society had centers in nearly all European countries during and after the last war. Its experience established four main principles: 1. It is impossible to separate relief from rehabilitation. 2. Short and long term policies in agriculture must run concurrently. 3. International coordination of monetary and fiscal policy is essential. 4. Personnel aid must be provided on a generous scale and must have special qualities of human sympathy as well as professional and practical qualifications.

Mr. A. J. Drexel-Biddle, American ambassador accredited to the allied governments in London, presided over one session and said that Russia's "scorched earth" policy meant not only the burning of Russian villages but the destruction of live stock, crops and all that could not be carried away. These conditions would call for large scale postwar relief and agricultural reconstruction. In Poland also reconstruction would be a serious problem. For the restoration of the crops, various types of good seeds would be required. In the reestablishment of live stock, artificial insemination, in which Russian scientists had made great advances, would play an important part. American and Canadian organizations should get ready to supply breeding stocks for live stock in Poland, in the scorched earth areas of Russia and in other European countries where live stock had suffered huge losses.

The British Medical Students' Association

In these days, when every calling has its organization and every branch of the medical profession has one, it is not strange that medical students should organize. Until April 1940 there was no organization which could claim to represent them. There was then in existence an organization of students in general, the National Union of Students, which was holding a congress. At this the first move was made to form the British Medical Students' Association as a faculty subcommittee of the National Union of Students. For a year no substantial change occurred. The British Medical Students' Association represented only a minority of the National Union of Students, about 30 per cent, and most were members of provincial medical schools whose universities were members of the National Union of Students. Many attempts were made to increase the membership of the British Medical Students' Association but with little success until July 1941, when it approached the Medical Planning Committee of the British Medical Association, which informed it that a memorandum representative of medical student opinion on reform of medical education would be welcome. The need to make this memorandum representative of

all medical schools was realized and their cooperation was sought. But for various reasons the connection with the National Union of Students proved an insuperable obstacle. An alternative organization to be fully representative of all medical schools is being formed.

The reform of medical education is the most important matter which the British Medical Students' Association has taken up. In the last ten years papers on this subject have been published in this country and in America. The most comprehensive is the final report of the American Commission on Medical Education, which was abstracted in THE JOURNAL, Dec. 24, 1932, page 2206. Another subject is the measures taken to safeguard the health of students. They vary greatly and are excellent in most hospitals, but there are exceptions. The conditions of admission of women to medical education have been the subject of much controversy and must be faced in order that a sound solution may be reached.

Scheme for Training the Disabled

In addition to the members of the fighting services, the merchant navy and the civil defense services disabled in the war, civilians are injured in air raids and accidents in factories. The Ministry of Labor has introduced a scheme for the resettlement in civil life of these disabled persons, including training for a new occupation when this is desirable. The winning of the war demands the full use of all available labor, and disabled men and women can make a valuable contribution to this end, in some cases by entering the munitions industry.

The Ministry of Labor has arranged for its officers to get into direct touch with disabled persons while still in the hospital to ascertain individual requirements in the way of employment and to do everything possible to meet them. The matter will also be discussed with the physician or surgeon attending the disabled person. In amputation cases there will be a special report from the limb fitting surgeon at the center where the artificial limb is supplied. Many disabled will want to return to their former occupation but will not know whether changes produced by the war in industry prevent this. Others will want to know which of the industries open to them will be of most value in the war effort. Some, prevented by their disablement from resuming their former occupation, will want to know what other occupation is available.

In many cases disabled persons will require training. Two schemes are administered by the ministry: the existing training scheme for munition work and a new scheme for the special benefit of the disabled. The cost of training is paid by the ministry, and the trainees are paid wages. Foreigners disabled in the war are eligible. There is medical supervision during the training course to ensure that this is suitable to the particular disablement.

Roentgen Examination in Pulmonary Tuberculosis

The National Association for the Prevention of Tuberculosis has issued a memorandum enjoining the greater use of radiographic methods in the discovery of tuberculosis, particularly of the symptomless cases in young apparently healthy persons. It points out that pulmonary tuberculosis begins without any warning to the patients. By the time they voluntarily come for treatment the disease is advanced and perhaps they have infected others. In the British Isles there are about a quarter of a million cases of pulmonary tuberculosis, of which about 1,500 between the ages of 15 and 50 prove fatal each month. For prevention we must more persistently try to discover early cases before they have become infectious, as this would ultimately mean the conquest of tuberculosis. The only method of detecting tuberculosis before it produces symptoms is x-ray examination of the chest. The association holds that when these facts are known public opinion will insist on this method taking the place of older less effective methods. The ideal would be examination of every young person on leaving school and at intervals during early adult life. Entry into the various occupations or into secondary schools and colleges provides an opportunity for this examination. Under the Factory Acts the certifying surgeon examines those who enter industry under the age of 16. This should include x-ray examination. At present our tuberculosis services deal only with those who come to them because they have symptoms of tuberculosis. Earlier detection would mean a better hope of eradicating the disease.

Soap Rationed

The latest substance to be rationed is soap. Every person's consumption per week is limited to 4 ounces of household soap, 3 ounces of toilet soap, 3 ounces of soap flakes or chips, 6 ounces of soft soap, 6 ounces of soap powder No. 1 or 12 ounces of powder No. 2. Shaving soap, scourers, shampoo, liquid soap and dental soap are not rationed. The decision to ration soap has been made not because there is a scarcity but to secure economy in the use of imported oils and fats and to make certain that available shipping space may be used to import edible fats. The Ministry of Food has been supplying soap manufacturers with 300,000 tons of fats yearly. Eigthy-two per cent of the total soap consumption is for domestic purposes. The ministry estimates that, with rationing, 80 per cent of the present consumption can be maintained.

The First $50,000,000 of the Red Cross Fund

The duke of Gloucester, president of the British Red Cross Fund, stated at a meeting that the collection by the fund of its first $50,000,000 was an encouraging achievement. Now in the third year of the fund it was hoped to add a further $25,000,000. Mrs. Churchill's Aid to Russia Red Cross Fund stood at $7,500,000. The Red Cross would in any case have helped Russia, but it congratulated Mrs. Churchill on her remarkable result. At present money is being collected weekly for the Red Cross at the following rates: workshops $125,000, house to house $85,000. The total weekly collections, mostly subscribed in amounts of 2 cents, amount to over $10,000,000 annually. Owing to the spread of the war to the Far East the demands on the Red Cross must continue to expand.

American Ambulances for the Allies

The thousandth vehicle for which the allies have to thank the British War Relief Society of America has been handed over for Russia by Mr. B. N. Cruger. The ambulance was accepted by Mme. Maiskiy, wife of the Soviet ambassador. The vehicles already given or maintained by the society represent only part of its activities for the allied cause. It maintains two hundred and seventy vehicles in Britain. In the quieter days now following the heavy air raids they carry 2,500 hospital patients weekly besides performing other duties. Traveling canteens are maintained for one year by their American donors. Some of the thousand vehicles are of unusual types. One is a mobile bathroom, given to the people of Plymouth for use in their evacuation area.

Heroism of a Woman Physician

The award of M.B.E. has been made to Dr. Adaline Nancy Miller, ship surgeon. Her ship was approached by a raider, which opened fire at long range. The defensive armament replied, but a shell put the main gun out of action and heavy structural damage was done. As the speed was less than that of the enemy, the captain gave orders to abandon ship. A signal to this effect was made to the enemy, but he continued shelling and holed many of the lifeboats. He then sank the ship by gunfire and made off. During the action Dr. Miller, with perfect calm, attended to the wounded and dying. She continued her work after the company had taken to the lifeboats.

BRAZIL

(From Our Regular Correspondent)

March 31, 1942.

Inguinal Hernia from the Legal Point of View

According to a paper by Dr. Eurico Branco Ribeiro, inguinal hernia usually is not the result of a single violent force but of repeated small forces over periods of months and years. From the legal point of view, inguinal hernia as an occupational disease and accidental hernia are well defined entities. The patients are inclined to attribute any hernia to some violent incident during their work, while the physicians, sure of the rarity of accidental hernia, refuse the patient's claim, forgetting the frequency of hernia as an occupational disease. Legal textbooks do not take into consideration preexisting conditions concerning hernia as an occupational disease; but predisposition has to be examined for accurate evaluation of the degree of incapacitation. Clinically the differentiation between inguinal hernia as a preexistent disease and as an occupational condition seems to be insoluble; even microscopic examination of the extirpated hernial sac cannot be an important method of differentiation, being of value only in proving that the patient has or has not an accidental hernia. Jurists emphasize that no one can be forced to have a hernia operation, but a worker who has broken a bone is obliged to submit to adequate treatment, clinical or surgical; Dr. Ribeiro does not see why a man who has an occupational hernia should not have to submit to surgical treatment. The latter should be obligatory, and an indemnity should be paid only in those rare cases in which permanent partial incapacity results. However, inguinal hernia is among the conditions for which there is indemnification and the worker chooses between operation or indemnification. This is not fair. The surgical treatment for hernia should be compulsory as a benefit to the employer and the worker. Only permanent partial incapacity resulting from surgical treatment would be subject to compensation, in the same way as the sequelae of ununited fracture.

Births and Deaths Among Negroes

There seems to be a decrease in the number of Negroes in Brazil. The following numbers refer to births and deaths in 1939 in the state of São Paulo, the population of which is estimated at 7,200,000 inhabitants:

Race	Births	Deaths
White	197,389	94,395
Negro	19,122	20,686
Yellow	9,880	2,471
Total	226,391	117,552

Rubens do Amaral, who has made statistical studies in all regions of the state of São Paulo, said that the mortality is higher among the Negroes in populous centers than it is in the country. He advises that the Negroes should live only in the country and he suggests several measures that would tend to improve their standard of living.

Vital Statistics in São Paulo

During 1941, 19,295 people died in the city of São Paulo, of whom 10,469 were males and 8,826 females. Cancer caused 1,190 deaths, tuberculosis 1,918, pneumonia 1,824, heart disease 1,834 and intestinal troubles 2,910. In the same period 34,355 children (17,581 boys and 16,774 girls) were born and 12,002 marriages were registered. Among the races, the deaths were as follows:

White	15,832	Negro	1,735
Mulatto	1,535	Yellow	192
Not specified	1		

Personal

Dr. Fernando Luz, professor of surgery in the Baia Faculty of Medicine, died suddenly at Salvador, Baia, of a heart attack two hours after performing a laborious operation for splenomegaly.

MEXICO CITY

(From Our Regular Correspondent)

March 1, 1942.

Better Homes for Workers

An act has been signed by the president of the republic and the minister of labor according to which all employers are obliged to provide sanitary habitations for their workers. Rent will be free, and the law fixes several terms to condition the different types of houses already available and to build new ones and specifies different penalties for disobedience to such regulations.

National Academy of Surgery

The National Academy of Surgery held its first session of the year on February 10 in the National Academy of Medicine in the School of Medicine. The session was presided over by Dr. Gustavo Baz, minister of assistance, Dr. Aquilino Villanueva, president of the Academy of Surgery; Licenciado Mario de la Cueva, dean of the University of Mexico; Dr. Jose Torres Torija, life secretary, and Dr. Joaquín Correa, executive secretary of the academy.

Control of Chemicals by the Department of Economics

In February the Department of Economics issued a decree requiring all manufacturers and dealers to send, within fifteen days, a manifest of their stock of acetone, ammonia, aniline oil, carbon tetarachloride, citric acid, copper sulfate, glycerin, phosphorus, potassium salts, sulfuric acid, methyl alcohol and several other chemicals, dyes and reagents. Manufacturers are ordered to use their stock only in their own factories. Exportation is forbidden, as well as raising of prices. The Union of Drug Stores and chemical laboratories complained in a recent meeting that many dealers have raised unlawfully the price of most medicines and chemicals.

Marriages

JAMES PETTIGREW BUNN, Rocky Mount, N. C., to Miss Margaret Elizabeth Smith of Heathsville, Va., February 28.

ROBERT JENNINGS MURPHY JR., Goldsboro, N. C., to Miss Katherine Trigg Evans of Christiansburg, Va., March 8.

ALBERT REINHOLD HUNT, Wayne, Pa., to Miss Ann Griswold Lillard of Orange, Va., March 14.

WADE MARTIN CLINE, Lakeland, Fla., to Miss Anita Hart Davies of Birmingham, Ala., recently.

HERBERT DANIEL TYLER, Charlotte, N. C., to Miss Jane Cook Coffin of Atlanta, Ga., April 9.

CYRUS EUGENE HAWKS, Rockville, Md., to Miss Eva Madora Hancock of Dobson, N. C., April 9.

JULIAN A. STERLING, Philadelphia, to Miss Reba Madeleine Shaffer of Merion, Pa., March 28.

EARL C. MACCORDY to Miss Regina Barbara Melber, both of St. Petersburg, Fla., March 4.

DE WITT DANIEL STUART to Miss Betty Sue Gardner, both of Brunswick, Mo., March 22.

JOHN TETARD GOODNER to Miss Helen Mathilde Gardiner, both of New York, April 29.

ARTHUR E. GENIUS to Mrs. Charlotte Satterlee, both of Winter Park, Fla., April 10.

JOSEPH A. CRISCUOLO JR. to Miss Betty Jackson, both of New Haven, Conn., May 15.

ISRAEL A. DINERMAN to Mrs. Mary C. Wendelstadt, both of Canaan, N. H., April 17.

JOHN C! MCLEOD JR., Bay Minette, Ala., to Miss Helen Jones of Auburn, April 2.

BENJAMIN G. OREN, Catskill, N. Y., to Miss Dorothy Sacks of Detroit, Dec. 28, 1941.

Deaths

James Dowling Trask ✠ associate professor of pediatrics at the Yale University School of Medicine, New Haven, Conn., died, May 24, in the Albert Merritt Billings Hospital, Chicago, of septicemia and acute peritonitis, aged 51. Dr. Trask was born in Astoria, L. I., N. Y., Aug. 21, 1890. He graduated from the Cornell University Medical College, New York, in 1917, and was an intern at the Bellevue Hospital, New York. He served during World War I from May 1918 to December 1919. He was assistant resident physician at the Hospital of the Rockefeller Institute for Medical Research, New York, from 1919 until 1921, when he joined the faculty at Yale University School of Medicine as an instructor in medicine. In 1925 he was made an assistant professor of medicine and in 1927 an associate professor of pediatrics. Since 1927 he had been an associate attending pediatrician at the New Haven Hospital and dispensary. In 1939 he was appointed a commissioner of the city board of health. He was a member of the American Pediatric Society, New England Pediatric Society, Association of American Physicians, American Society for Clinical Investigation, American Clinical and Climatological Association and the Society of American Bacteriologists. He was also a member of the American Board of Pediatrics. In 1931 he was a member of the original Yale Poliomyelitis Commission to fight infantile paralysis after an epidemic of the disease had swept through Connecticut. At the meeting of the American College of Physicians in April 1942 he received jointly with Dr. John R. Paul the John Phillips Memorial Medal. Dr. Trask was a nationally known investigator in the field of infantile paralysis and during the last month was working in Army posts in the Chicago area on problems of hemolytic streptococcus infection as a member of the Commission on Hemolytic Streptococcal Infections of the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, under an appointment as consultant to the Secretary of War.

Julius P. Dworetzky ✠ Liberty, N. Y.; Long Island College Hospital, Brooklyn, 1910; member of the American Laryngological, Rhinological and Otological Society and the American College of Chest Physicians; fellow of the American College of Physicians; member of the American Board of Internal Medicine, Inc., and the American Board of Otolaryngology; served during World War I as a captain with the American Red Cross and with the Rockefeller Commission for the control of tuberculosis in France; director of medicine and visiting physician, Municipal Sanatorium, Otisville; visiting physician, Maimonides Hospital; consulting physician, Ulster County Tuberculosis Hospital (Kingston), Elizabeth A. Horton Memorial Hospital (Middletown), St. Francis Hospital (Port Jervis) and St. Clare's Hospital (New York); medical examiner, Veterans Administration; aged 55; died, April 20, of brain tumor.

Philip Allen Halper ✠ Chicago; University of Minnesota Medical School, Minneapolis, 1923; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; member of the American Board of Ophthalmology and the American Board of Otolaryngology; formerly instructor in otolaryngology, associate in laryngology, rhinology and otology and associate in ophthalmology at the University of Illinois College of Medicine; assistant city and county physician, St. Paul, 1924-1925; associate ophthalmologist, Illinois Eye and Ear Infirmary; attending ophthalmologist, Michael Reese Hospital and the Mandel Clinic; on the visiting staff of the Grant Hospital; associate editor of Cyclopedia of Medicine; aged 44; died, April 21, in Palm Springs, Calif., of hypertension.

Thomas Henry Culhane ✠ Rockford, Ill.; Rush Medical College, Chicago, 1890; past president of the Winnebago County Medical Society; formerly vice president of the Illinois State Medical Society; fellow of the American College of Surgeons; on the staffs of the Rockford and Winnebago County hospitals; for many years member and at one time president of the school board; aged 73; died, April 14, in Rochester, Minn.

Andrew Merriman Young Jr., Oklahoma City; Vanderbilt University School of Medicine, Nashville, Tenn., 1909; served during World War I; at one time served as assistant surgeon in the U. S. Public Health Service; a former director of the state venereal disease bureau; aged 55; died, March 18, of heart disease at Kerrville, Texas.

Bernice Turner Wright ✠ Memphis, Tenn.; University of Tennessee College of Medicine, Memphis, 1927; fellow of the American College of Surgeons; on the staff of the Veterans Administration Facility; aged 39; died in March at the Baptist Memorial Hospital of an injury received in an automobile accident.

Samuel Edward Sibley ✠ Sioux City, Iowa; State University of Iowa College of Medicine, Iowa City, 1893; fellow of the American College of Surgeons; past president of the Woodbury County Medical Society; on the staffs of St. Vincent's and Methodist hospitals; aged 72; died, March 18, of heart disease.

Sidney L. Feldstein ✠ Harrisburg, Pa.; Medico-Chirurgical College of Philadelphia, 1902; formerly on the staffs of the Jewish and Stetson hospitals, Philadelphia; director of the x-ray service of the state department of health; aged 61; died, April 27, in the Jefferson Hospital, Philadelphia, of cerebral hemorrhage.

George Wyckoff Cummins ✠ Belvidere, N. J.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1890; for many years county physician, member of the city board of health and board of education; aged 77; died, April 17, in the Easton (Pa.) Hospital.

Roscoe C. Field, Sheridan, Ore.; University of Oregon Medical School, Portland, 1905; University of Louisville (Ky.) Medical Department, 1910; for many years city councilman, member of the school board and mayor; aged 63; died, April 6, in a hospital at Portland of pneumonia and meningitis.

Clarence Crane, Fernbridge, Calif.; Boston University School of Medicine, 1900; formerly assistant professor of surgery at his alma mater; fellow of the American College of Surgeons; at one time on the staff of the Massachusetts Memorial Hospitals, Boston; aged 70; died, April 13.

Wilbur Curtis Hunsucker, Bennettsville, S. C.; Medical College of the State of South Carolina, Charleston, 1934; member of the South Carolina Medical Association; on the staff of the Marlboro County General Hospital; aged 31; died, April 2, of cerebral hemorrhage.

Joseph Albert Gregory, Buffalo; University of Buffalo School of Medicine, 1908; member of the Medical Society of the State of New York; for many years a member of the board of health and a school inspector; aged 58; died, April 7, of carcinoma of the esophagus.

Archibald Wallace Dunn ✠ New York; University of Pennsylvania School of Medicine, Philadelphia, 1912; fellow of the American College of Surgeons; served during World War I; aged 59; died, April 29, in the Lenox Hill Hospital of cerebral hemorrhage.

Robert Burnside Dawson, Smiths Ferry, Pa.; Western Reserve University Medical Department, Cleveland, 1893; member of the Medical Society of the State of Pennsylvania; aged 78; died, April 17, in the City Hospital, East Liverpool, Ohio, of uremia.

Wilton F. Blackford, Louisville, Ky.; Kentucky School of Medicine, Louisville, 1901; medical director of the Commonwealth Life Insurance Company; aged 69; died, April 2, in the Kentucky Baptist Hospital of carcinomatosis with obstruction of the intestine.

Lynn J. Tuttle, Douglas, Ariz.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1902; fellow of the American College of Surgeons; for many years mayor of Douglas; aged 72; died, March 19, of coronary occlusion.

Seth De Blois, Newport, R. I.; University of Maryland School of Medicine, Baltimore, 1905; formerly county medical examiner; aged 59; president of the medical staff of the Newport Hospital, where he died, April 26, of coronary thrombosis.

David Erastus Peek, Six Mile, S. C.; Emory University School of Medicine, Atlanta, Ga., 1918; member of the South Carolina Medical Association; served during World War I; owner of a hospital bearing his name; aged 51; died, March 16.

M. Russell Wilcox, Los Angeles; University of Minnesota College of Medicine and Surgery, Minneapolis, 1897; formerly assistant professor of physiology at his alma mater; member of the California Medical Association; aged 73; died, March 25.

John Tinkler ✠ Buffalo; University of Buffalo School of Medicine, 1907; formerly instructor in anatomy at his alma mater; aged 62; died, March 9, in the Buffalo General Hospital of gastric ulcer and massive gastric hemorrhage.

John Riegelman, Mamaroneck, N. Y.; Bellevue Hospital Medical College, New York, 1894; formerly coroner's physician and assistant medical examiner in the Bronx; aged 69; died, March 4, in the United Hospital, Port Chester.

Samuel Kendig Wallace ✠ Baltimore; Johns Hopkins University School of Medicine, Baltimore, 1927; aged 40; died, March 3, in the Johns Hopkins Hospital of massive hemorrhage due to carcinoma of the transverse colon.

Sigfrid J. Cheleen, Fergus Falls, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1906; formerly on the staff of the Swedish Hospital, Minneapolis; aged 68; died, April 1, of coronary occlusion.

Russell Herbert Andrew ✠ Massena, N. Y.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1935; aged 32; died, April 28, in the Potsdam (N. Y.) Hospital of injuries received in an automobile accident.

Henry Shelby Van Cleave, Burkburnett, Texas; University of the South Medical Department, Sewanee, Tenn., 1898; formerly health officer of Burkburnett; aged 78; died, March 5, of uremia in a hospital at Fort Worth.

Andrew Fremont Wagner ✠ Los Angeles; University of Pennsylvania Department of Medicine, Philadelphia, 1899; for many years autopsy surgeon for Los Angeles County; aged 74; died, March 28, of arteriosclerosis.

Charles Reiter ✠ New York; Hahnemann Medical College and Hospital of Philadelphia, 1937; was called to active duty May 23, 1941 as a lieutenant (j. g.), medical corps, U. S. Naval Reserve; aged 29; was killed on the destroyer U. S. S. *Truxton,* which was wrecked in a storm on the coast of Newfoundland, February 18.

Inez Louise Clarke, Cambridge, Mass.; Tufts College Medical School, Boston, 1904; member of the Massachusetts Medical Society; aged 73; was found dead, March 7, presumably of cerebral hemorrhage.

Daniel Matthews Carter, Madison, Ga.; Atlanta College of Physicians and Surgeons, 1912; member of the Medical Association of Georgia; past president of the county board of education; aged 60; died, April 11.

Burt Davis Harrington ✠ Brooklyn; Long Island College Hospital, Brooklyn, 1896; fellow of the American College of Surgeons; president of the board of directors of the Midwood Hospital; aged 68; died, April 15.

William James Dobbie, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1905; for many years on the staff of the Toronto Hospital for Consumptives, Weston; aged 69; died, April 20.

William Robert Haynie, West Memphis, Ark.; Memphis (Tenn.) Hospital Medical College, 1895; served during World War I; formerly member of the state legislature; aged 79; died, April 12.

Edward Parker Moser, San Francisco; University Medical College of Kansas City, Mo., 1903; Rush Medical College, Chicago, 1910; aged 70; died, March 13, of arteriosclerosis and heart disease.

Persons Walton Wing, Canaan, N. H.; Long Island College Hospital, Brooklyn, 1902; served during World War I; aged 64; died, March 20, in Orlando, Fla., of coronary occlusion.

Theodore Burton Ackerly, Glastonbury, Conn.; Long Island College Hospital, Brooklyn, 1897; formerly health officer of New Hartford; aged 68; died, April 15, of coronary occlusion.

Monroe Holben Solliday ✠ Taylorville, Ill.; Jefferson Medical College of Philadelphia, 1901; on the staff of St. Vincent's Hospital; aged 68; died suddenly, March 28, of coronary occlusion.

Robert Ophenalia Currey, Chattanooga, Tenn.; University of Tennessee College of Medicine, Memphis, 1912; member of the Tennessee State Medical Association; aged 60; died, April 26.

Willard Parker Beach, New York; College of Physicians and Surgeons, medical department of Columbia College, New York, 1881; aged 82; died, April 18, of congestive heart disease.

Johan Alfred Rundstrom, Torsebro, Sweden; Karolinska Mediko-Kirurgiska Institutet, Stockholm, Sweden, 1892; formerly a practitioner in Chicago; aged 80; died, March 27.

Jeremiah M. Lindsey, Ranburne, Ala.; Chattanooga (Tenn.) Medical College, 1897; member of the Medical Association of the State of Alabama; aged 73; died, March 1.

Charles Leicester Rybke ✠ Portland, Ore.; University of Oregon Medical School, Portland, 1909; on the staff of the Good Samaritan Hospital; aged 61; died, March 19.

Jacob R. Welch, Spencerville, Ohio; Fort Wayne (Ind.) College of Medicine, 1882; member of the Ohio State Medical Association; bank president; aged 82; died in March.

Harvey Reyburn Glenn ✠ Cochranville, Pa.; Medico-Chirurgical College of Philadelphia, 1906; aged 57; died, March 19, in the Lancaster (Pa.) General Hospital.

Lawrence Chamberlain Grosh Jr. ✠ Toledo, Ohio; Johns Hopkins University School of Medicine, Baltimore, 1930; aged 37; died, April 17, of a self-inflicted bullet wound.

John Franklin Jones, Le Roy, Ill.; Colorado School of Medicine, Boulder, 1895; served during the Spanish-American War and World War I; aged 81; died, March 16.

DIED IN MILITARY SERVICE

CHARLES REITER, M.D.,
1912-1942

Daniel Bluford Stough, Vinita, Okla.; Kentucky School of Medicine, Louisville, 1887; member of the Oklahoma State Medical Association; aged 85; died, March 19.

Linton Turner ✠ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1903; on the staff of the Memorial Hospital; aged 63; died, March 15.

David D. Wickson, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1893; aged 71; on the staff of the Toronto Western Hospital, where he died, March 16.

Louis Neuwelt, New York; Columbia University College of Physicians and Surgeons, New York, 1905; aged 60; died, March 13, in the Jewish Memorial Hospital.

William Robert Shortridge, Flasher, N. D.; Keokuk (Iowa) Medical College, 1898; aged 74; died, March 16, in a hospital at Bismarck of intestinal obstruction.

Charles Anthony Squires, Plainfield, N. J.; Cornell University Medical College, New York, 1904; served during World War I; aged 64; died, March 21.

John Wallace Henderson, Kennedy, N. Y.; Cleveland Homeopathic Medical College, 1899; veteran of the Spanish-American War; aged 67; died, March 30.

John Nathan Eisman, Cincinnati; Harvard Medical School, Boston, 1938; aged 30; was found dead, April 27, of an overdose of sleeping tablets, self administered.

Duncan Smith, Fingal, Ont., Canada; University of Toronto Faculty of Medicine and the Western University Faculty of Medicine, London, 1890; died, March 26.

Melville F. Boulden ✠ Frankfort, Ind.; Illinois Medical College, Chicago, 1903; aged 72; on the staff of the Clinton County Hospital, where he died, April 7.

John Ellsworth Witham, Waynesville, Ohio; Miami Medical College. Cincinnati, 1889; aged 79; died, March 11, in Xenia of chronic myocarditis.

Henry Philip Diekmeier ✠ Cincinnati; Miami Medical College, Cincinnati, 1895; aged 70; died, April 2, of nephritis and dilatation of the heart.

Paul Burmaster, Orlando, Fla.; Hahnemann Medical College and Hospital, Chicago, 1895; aged 74; died, February 15, of coronary sclerosis.

John Albert Riley, Alameda, Calif.; California Medical College, San Francisco, 1900; aged 76; died, March 28, of angina pectoris.

John Ernst Barnstein, Manitowoc, Wis.; Milwaukee Medical College, 1896; also a pharmacist; aged 89; died, April 20, of myocarditis.

Bureau of Investigation

CEASE AND DESIST ORDERS

Abstracts of Certain Federal Trade Commission Releases

The work of the Federal Trade Commission, in helping to protect the public against misrepresentation or fraud in the medical as well as other fields, has been greatly extended by the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act. The Food, Drug and Cosmetic Act of 1938 added to the Food and Drug Administration's control of the advertising claims and statements made on the labels of medicine or on the carton or in the accompanying leaflet, whereas what might be termed collateral advertising, that which appears in newspapers and magazines and over the air, comes more actively under the purview of the Federal Trade Commission by virtue of the Wheeler-Lea Amendment.

THE JOURNAL has at various times commented on the activities of the Federal Trade Commission in this connection, even before the Wheeler-Lea Amendment gave it its added rights. In some cases the Commission may accept from the person or concern involved a stipulation that the objectionable practices or claims cited will be discontinued. In other cases the Commission issues what is known as a Cease and Desist Order, in which the individual or company cited is ordered to cease and desist from practices which have been declared objectionable. Abstracts of some of the orders issued during 1941 follow:

A B C Gauzband.—This was advertised by the American Bandage Corporation, Chicago, as being "medicated with an antiseptic and germicidal material rendering it self-sterilizing." This, according to the company, was the result of "a secret process used exclusively by the manufacturer," and the bandage was further claimed to "remain sterile even after it is removed from the package." The Federal Trade Commission declared that these claims were untrue and in September 1941 ordered the promoters of the A B C Gauzband to discontinue them.

Clairol.—This hair coloring is put out by Joan Gelb, Morris Gelb and Leon A. Spilo, formerly of New York, who operate under the title Clairol, Incorporated, with headquarters at Stamford, Conn. There are two Clairol products—the "Instant" and the "Progressive." The Instant was found some years ago by the American Medical Association's chemists to belong to the aniline derivative type of hair dyes, after reports of inflammation of the skin following its use had been received. The Progressive Clairol apparently was at first only a simple tint but seems to have had some aniline substance later added to it. In October 1941 the Federal Trade Commission ordered Joan and Morris Gelb and Leon A. Spilo to cease representing that their preparations are not hair dyes, that they recondition the hair or restore its natural or youthful color or that the results obtained are permanent, that the products supply nourishment to the hair, that they are made or compounded in France, that Instant Clairol is safe to use and that the number of treatments of their preparations used by the public is greater than is the fact.

Copinol.—This product, also known as "Copinol Nasal Medicine," is put out by a Robert E. Overell of Los Angeles, who does business as the Copinol Company. In September 1941 the Federal Trade Commission ordered Overell to cease representing that his product is a cure or remedy for head colds, catarrh-choked nose and throat or sinus congestion, or has any value in treating such conditions beyond furnishing temporary relief to congested mucous membrane or will rid the nose and throat of, or protect the nose from, germ-laden mucus, instantly clear the head or afford quicker and more lasting relief than similar preparations. Overell also was ordered to discontinue any advertisements which failed to reveal that Copinol should not be used by persons suffering from heart trouble, high blood pressure, diabetes or thyroid disorders or that the use of his mixture over a long period may produce prolonged nasal constriction resulting in tissue damage from anoxemia; provided, however, that if the label of the preparation contains a warning of the potential dangers in its use, such advertisements need contain only the cautionary statement: "Caution, use only only as directed on the label." THE JOURNAL, Aug. 17, 1935, page 528, contained an abstract of an action brought by the Food and Drug Administration against the Copinol Company of Los Angeles for making fraudulent claims on the labels, which represented Copinol as a remedy for catarrh, hay fever, sinus trouble and some other things. In the same connection the government chemists had reported that Copinol consisted essentially of mineral oil, with a trace of an alkaloid such as berberine, and perfume.

Duncan's Ozon.—The Ozon Chemical Company, Inc., trading as Duncan Chemical Company, St. Louis, was ordered by the Federal Trade Commission in September 1941 to discontinue the following misrepresentations in the sale of this product: that it is a cure or remedy or has any value in the treatment of sore throat, poison ivy, athlete's foot, colds or coughs or affords any benefit in the treatment of coughs beyond such comfort as it offers through its expectorant properties. THE JOURNAL, Aug. 26, 1933, page 725, reported a case in which a shipment of Duncan's Ozon was declared to violate the National Food and Drugs Act because the labels falsely represented it as a remedy for rheumatism, kidney and bladder disorders, indigestion, pyorrhea and some other things. Government chemists at that time reported that it consisted essentially of pine oil.

"Dupree" and "Dr. Gordon's" Nostrums.—Ben Gordon and Louis Gordon, trading as Bengor Products Company and Golf Products Company, New York, put out two products, one known as "Dupree Pills" and "Dr. Gordon's Single Strength Pills" and the other as "Dupree Pills Double Strength" and "Dr. Gordon's Double Strength Pills." In July 1941 the Federal Trade Commission reported that the single strength product contains, among other ingredients, extracts of cotton root bark and black hellebore and the double strength pills, ergotin. The Commission ordered the Gordons to cease disseminating any advertisements that represent these products as safe and effective treatments for amenorrhea and dysmenorrhea or that fail to reveal that the use of them may result in gastrointestinal disturbances leading to other serious ailments. In September 1939 the Commission had issued a similar order against Robert C. Oberlin, trading as Research Products Company, Cleveland, which was distributing these preparations.

Helena Rubinstein Products.—Four of these, the "Town and Country Face Powder," "Eye Lash Grower Cream," "Eye Lash Cream and Darkener" and "Egg Complexion Soap," were advertised by Helena Rubinstein, Inc., New York, under exaggerated, false and misleading representations, according to the Federal Trade Commission. In July 1941 the Commission ordered the Rubinstein concern to discontinue such misrepresentations as that its face powder is, among other things, "proof against drying of the skin . . . enlarging the pores . . . the onslaughts of weather . . ."; that the "eyelash grower" is intended for "lovely long lashes"; that the eyelash cream and darkener "makes the lashes dark and silky," or "prevents them from breaking" and that the egg complexion soap "purifies the skin" and "is made of eggs and soothing oils."

Hy-Phen.—In June 1937 Bradley's Laboratory, Inc., of Matoaka, W. Va., signed a stipulation with the Federal Trade Commission that it would cease representing that its "Hy-Phen Tablets" relieve all types of pain and headache, are safe in all instances and constitute a competent treatment for colds. The concern also agreed to drop the words "laboratory" and "manufacturers." In July 1941 the Commission ordered Hy-Phen Corporation, Matoaka, W. Va., successor to Bradley's Laboratory, Inc., to discontinue the following misrepresentations in its advertising: that Hy-Phen will prevent or cure colds or is anything other than an analgesic giving temporary relief from painful symptoms; that it is superior to other products of its type or has any therapeutic value in treating such conditions as migraine headaches, infectious diseases, headaches due to infection, pains caused by abscessed teeth or by pressure on nerves, or that its use is entirely free from danger. In fact, the Commission reported that the product contains acetophenetidin, caffeine and hyoscyamus.

Improved White Ribbon Remedy.—This product of the Gates Medicine Co., Inc., Charleston, W. Va., was known as "White Ribbon Remedy" prior to January 1940. The Federal Trade Commission reported in August 1941 that as the original preparation, White Ribbon Remedy, contained tartar emetic it would not be a safe or reliable remedy for the liquor habit; that in the product as sold under the newer and longer name, tartar emetic was eliminated and there were substituted in each box 2,160 international units of thiamin chloride (vitamin B_1) with sugar of milk as a carrying body, and no other ingredient. The Commission's findings were that, though the new product may contribute a negligible portion of normal human vitamin requirements, it is not effective as a liquor habit cure, and the Commission thereupon issued an order against the Gates Medicine Company, Inc., to cease representing it as such a cure and to discontinue any advertising which fails to reveal that the use of the preparation may cause depression of the cardiovascular system, chronic irritation of the stomach and intestinal tract, nausea and failure to eat and get the proper amount of food minerals and vitamins necessary to maintain health.

Jacks or Jacque.—This product, put out by Lambert Agin, trading as Jacks Chemical Company and Jacque Chemical Company, Pleasant Ridge Station, Cincinnati, was reported by government chemists to be nothing more than a diluted aqueous solution of nitric, hydrochloric and acetic acids, approximately 10 per cent in strength. The Federal Trade Commission in August 1941 declared that the product is wholly incapable of effecting any of the results claimed for it in the treatment of the conditions designated, and ordered Agin to cease representing it as a cure or remedy for gall, kidney and bladder stones, diabetes, rheumatism, swollen limbs, hives, excess acid and excess uric acid.

"Kemico" Products.—These are put out by one F. W. Johnson, trading as Kemico, Park Ridge, Ill. In August 1941 Johnson was ordered by the Federal Trade Commission to cease misrepresenting in his advertisements the alleged effectiveness of preparations compounded from his formulas: (1) for certain skin preparations, such formulas being known as "Greaseless Massage Cream," "Lemon Greaseless Cream," "Beauty Balm," and "Debest Skin Treatment"; (2) for the hair, such formulas being known as "Hair-Lay Cream" and "Dandruff Remedy"; (3) for catarrh, colds and similar ailments, the formulas being known as "Catarrhal Cream," "Vapor Inhalant," "Nasal Jelly," "Pine Oil Nasal Spray," and "Menthol and Camphor Nasal Spray"; and (4) for the teeth ("Teeth Whitener Formula A" and "Formula B"). Specifically, Johnson was ordered to cease representing, through the use of the word remedy or similar terms, that the mixture compounded from his "Dandruff Remedy" formula will cure dandruff or have any other effect than giving certain temporary relief; and that the preparations compounded from his "Teeth Whitener Formula A," "Pine Oil Nasal Spray," "Menthol and Camphor Nasal Spray" and "Nose Inhalant" are entirely safe to use.

Madame Bea's Capsules.—That these are a safe and effective treatment for delayed, unnatural or suppressed menstruation is a misrepresentation that the Federal Trade Commission in October 1941 ordered David L. Silver and O. C. Cowles, trading as Kay's Cut Rate Drugs, Beckley, W. Va., to discontinue in their advertising. They were also ordered to cease disseminating any advertisements that failed to reveal that the use of the product may cause gastrointestinal disturbances, excessive congestion and hemorrhage of the pelvic organs and in cases of pregnancy may result in uterine infection and blood poisoning.

Marrilis.—This was put out as a weight reducer by one I. Burman, trading as Burtley Company, New York. Burman, according to the Federal Trade Commission, represented that by coating the body with a film of Marrilis the pores of the skin would be closed and could not take in oxygen; that the body would then undertake to supply this lack of oxygen from the system and that the result of the pouring out of perspiration and burning up of fat would reduce body weight. The Commission found this theory to be false and in July 1941 ordered Burman to discontinue the foregoing misrepresentations as well as the implication that his product was compounded by one of the world's leading cosmetic scientists.

Martha Beasley's Compound Formula No. 2 and No. 3.—These were advertised by J. V. Cordes and Mrs. J. H. Cordes, doing business as Martha Beasley Associates, Detroit, and represented as safe and effective treatments for delayed menstruation and as being recommended by physicians generally. The Federal Trade Commission, however, found that they contained dangerous drugs which might produce serious results if taken in the doses recommended. In September 1941 the Commission ordered the promoters to discontinue the foregoing representations and to cease disseminating advertisements which failed to reveal that the use of the products may cause gastrointestinal disturbances and excessive congestion and hemorrhage of the pelvic organs and, in case of pregnancy, bring about uterine infection and blood poisoning.

Perfect Voice Institute.—This Chicago concern was said to have had for its chief officers a Eugene Feuchtinger, Walter A. Jordon and Mary E. Murphy. The "institute" promoted a correspondence course in voice development, whic' , according to the Federal Trade Commission, consisted of approximately thirty lessons with which were furnished mechanical aids including a mirror, flash light, pitch pipe, tongue supports and depressors, a tape measure and a "mouth gauge." In September 1941 the Commission ordered the Perfect Voice Institute and its officers to cease and desist from representing that the development and control of the muscles of the tongue or the use of their course of instruction has any beneficial effect on the voice other than to make it louder or stronger; or representing that by use of their course of instruction physical defects of the vocal organs may be corrected or stammering overcome.

Pond's New Skin Vitamin Creams and Danya Lotion.—The creams in question consist of a "liquefying" cream, a cold cream and a vanishing cream. Since 1938, according to the Federal Trade Commission, each of these products of the Pond's Extract Company, New York, has contained 3,100 vitamin A units and 165 vitamin D units, and the advertising has described the vitamin A as a "skin vitamin" and as having the effect of nourishing the skin. The lotion was represented as storing up the "skin vitamin" in the hands of the user. The creams were further represented to penetrate to the under skin of the user, stir it to vigorous action and keep it active, and also apparently to wipe away lines and blemishes and freshen and smooth the skin. The Commission found that the small amount of vitamin A in the creams is in contact with the skin for so short a time that no effective absorption can take place and even if it could, and were carried into the blood stream, the effect would be systemic and not local. Accordingly, in September 1941 the Commission ordered the Pond concern to discontinue the foregoing misrepresentations.

Rosse Rheuma Tabs.—In August 1941 the Federal Trade Commission ordered Edward C. Rose, trading as Rosse Products Company, Chicago, to discontinue false and misleading representations in the promotion of this product, such as that it is a cure or remedy for rheumatism, rheumatic pains or sensitive joints, or furnishes anything beyond temporary relief from the symptoms of pain.

Spencer System.—Under this name John L. Shea, William J. Hagerty, Jean G. Mitchie and Glenda S. Hills, all of Boston, sold "courses" in which they instructed students in the design and fabrication of arch supports and "foot exercisers." In September 1941 the Federal Trade Commission ordered the Spencer System and the persons named to cease and desist from the following misrepresentations: that their courses of instruction, or any substantially similar ones, will equip anyone with learning and proficiency adequate to diagnose and determine whether foot troubles require surgical treatment and to treat effectively nonsurgical foot troubles or any foot disorders whatever.

Sterling Diathermy Machine.—According to the findings of the Federal Trade Commission, this device consisted principally of a high frequency generator encased in a portable wooden cabinet and was applied to the patient by placing the condenser pads in such position that the power might pass between them through the affected area at stated intervals for varying periods of time. The Commission found further that the use of this device for self treatment by the unskilled layman would not accomplish the results claimed by its promoters, and that it was not a safe, scientific and effective method for the relief, cure or treatment of self diagnosed ailments of the human body. In September 1941 the Commission ordered Nolan B. Stadley, trading as the Sterling Appliance Company, Los Angeles, to cease making false and exaggerated claims for his mechanism and to discontinue any advertisements which failed to reveal that the unsupervised use of the device by persons not skilled in the diagnosis, analysis and methods of treatment of disease may result in serious and irreparable injury to health.

Thermalaid.—This is an electrical device promoted by Thermalaid Method, Inc., Steubenville, Ohio. In July 1936, when the device was being put out under the name of the Electro Thermal Company of Steubenville, the Federal Trade Commission ordered this concern to cease representing that the use of the device constitutes a competent treatment or cure for prostatitis, hypertrophy or any other ailment and that those who use it may expect immediate relief from backache, pains, worry and debilities due to prostatic trouble. The case was discussed at some length in this department of THE JOURNAL, Oct. 3, 1936, page 1150. Perhaps it was because of this government action that the Electro Thermal Company changed its name, for in August 1941 the Commission ordered the Thermalaid Method, Inc., the trade style now used, and its president, Charles H. McFarland of Steubenville, to discontinue the following misrepresentations in the advertising of their device: that the use of the Thermalaid will prolong the vigorous years of one's life and recuperate one's vitality or sex virility, provide a cure or remedy for prostatic gland disorders, or offer any relief from prostatic disorders besides what might result from the local application of heat in cases of acute or chronic prostatitis in its milder forms. (The original Electro Thermal Company was once reported to be run by a John G. Homan, who branched out into other fields of quackery. A Post Office fraud order which closed the mails to his "rupture cure" outfit, the "New Science Institute," was dealt with in this department of THE JOURNAL, Nov. 16, 1935, page 1625.)

Trox Tablets.—In September 1941 the Federal Trade Commission ordered W. S. and G. L. McClymonds, formerly known as Oxol Laboratories, Denver, to discontinue the following misrepresentations in the sale of this product: that Trox Tablets constitute a cure or remedy for various diseases and ailments of the kidneys and the prostate gland, or possess any therapeutic value in the treatment of such conditions. In THE JOURNAL, Nov. 11, 1939, page 1828, a case was reported in which the Food and Drug Administration had declared Trox Tablets, put out by Oxol Laboratories, Denver, to be fraudulently represented on the labels as effective for urinary infections, cystitis, prostatic and venereal disorders in violation of the Food and Drugs Act. In this connection government chemists had reported that the product was essentially a mixture of charcoal, starch, magnesium carbonate, extracts of plant materials c ntaining saponins, and a small amount of oxyquinoline sulfate.

Vibratherm.—The Vitaphore Appliances, Inc., South Bend, Ind., signed a stipulation with the Federal Trade Commission in January 1938 in which it promised to cease representing that the Vibratherm produces a tonic effect on the entire nervous system immediately; also that it gives almost immediate relief to sufferers from prostatic disorders, is a competent remedy for constipation and relieves hemorrhoids. In April 1941 the Commission definitely ordered this concern to cease representing that the Vibratherm is a cure or remedy for prostatitis or is of any value in that condition in excess of giving temporary relief from symptoms of pain or that the use of this device is a remedy for bladder weakness, backache, headache, limb pains or nervousness, or that it has any value in the treatment of hemorrhoids, constipation, sexual decline or women's disorders.

Vitale Instantaneous Hair Dye.—This product, put out by Casimiro Muojo, trading as Alvi, Inc., and Alvi Company, New York, was also known as "Vitale Hair Coloring," "Vitale Rapid Hair Coloring," "Vitale Rapid," "Vitale Hair Dye" and simply as "Vitale." In August 1941 the Federal Trade Commission ordered Muojo to discontinue advertisements which represent that this product is a safe or scientific one, and free from harmful, injurious or dangerous chemicals, that its use will end prematurely gray hair or produce a permanent, natural, uniform shade or give the warmth, color, luster or glint of youth to the hair; and also to discontinue advertisements which fail to carry conspicuously the caution that the product contains ingredients which may cause skin irritation in certain individuals, that preliminary tests described in accompanying directions should first be made, and that to use the preparation for dyeing the eyelashes or eyebrows may cause blindness. Muojo was permitted, however, to limit this warning in the advertisements to the statement "CAUTION: Use only as directed on label," if and when such label bears the first described caution conspicuously displayed and the accompanying labeling gives adequate instructions for such tests before each application.

Witol Cosmetics.—These include "Witol's New Liquid Skin Peel" and "Take-Off." In May 1941 the Federal Trade Commission ordered Witol, Inc., and its president, William Witol, as well as Witol Beauty Laboratories, Inc., New York, to discontinue advertisements which represent that these two products will remove the outer layer of the skin and give the user a new fresh surface skin; that these are effective in treating pimples, blackheads, whiteheads, freckles or superficial blemishes or will cause large pores or fine lines to diminish.

Woodbury's Cosmetics.—In November 1935 the Jergens-Woodbury Sales Corporation, Cincinnati, signed a stipulation with the Federal Trade Commission in which it agreed to cease representing that its facial creams constitute a new or unique protection from the danger of blemishes or will give the skin the care that makes beauty safe, or change aging dryness to supple youth; that "Element 576" directly gives the skin vital energy or such energy as vitamins in foods bring to the body, or that Element 576 in Woodbury's Cold Cream causes the oil glands beneath the skin's outer surface to function better. In September 1941 the Commission ordered the Jergens-Woodbury Sales Corporation, Cincinnati, to discontinue the following misrepresentations in the sale of a facial soap, a facial powder, a cleansing cream, a facial cream, a cold cream and a "tissue cream": that the powder and cold cream are sterile and germ free, both before use and continuously during use, that they will guard the skin against blemishes, prevent infections from germs and kill germs under conditions of normal use; that the powder will spread farther than competitive products; that the presence of vitamin D in the creams will help users fulfil their "fondest hopes for beauty" and that the vitamin D present in the soap will benefit the skin.

Correspondence

SULFONAMIDE DERIVATIVES AND BACTERIAL CONTAMINATION OF STORED PLASMA

To the Editor:—In THE JOURNAL, February 14, appeared an article by Dr. Milan Novak entitled "The Use of Sulfonamide Derivatives as a Solution to the Problem of Bacterial Contamination in Stored Plasma."

or serum, with and without the drug, were inoculated with less than 20 bacteria per cubic centimeter and then held at 37 C., 22 C. and 6 C. The highest temperature was used to simulate summer room temperature. Subcultures of 1 cc. were made at intervals of three, ten and twenty-two or thirty days in semifluid agar containing para-aminobenzoic acid. In certain instances dilutions were made before cultures were taken. Some plate counts were also made of the motile bacteria. However, plate culturing alone, which was apparently used by Dr. Novak, was found inadequate, for certain bacteria after having been in contact with the drug would not start growing for several days, during which time the plate became too dry to support growth,

TABLE 1.—*The Influence of 0.2 per Cent Sodium Sulfathiazole on Bacteria in Normal Human Plasma Pooled from Nine Donors and Held in the Liquid State*

Bacterium		Staphylococcus aureus		Pseudomonas aeruginosa		Bacillus subtilis		Streptococcus bovis	
Inoculum		8 Bacteria/Cc.		10 Bacteria/Cc.		<1 Bacterium/Cc.		8 Bacteria/Cc.	
	Days	Control, 1 Cc.	Drug, 1 Cc.	Control, 1 Cc.	Drug, 1 Cc.	Control, 1 Cc.	Drug, 1 Cc.	Control, 1 Cc.	Drug, 1 Cc.
37 C.	3	+++	10^3	$>10^3$	0	$>10^3$	$>10^{2*}$	++++	++++
	10	++++	10^4	++++	0	++++	Lost	10^4	10^4
	22	++++	10^4	++++	0	++++		10^4	10^4
22 C.	3	++	20	++++	0	++++	+++	++++	++++
	10	++++	+++	++++	0	10^7	10^6	$>10^5$	$>10^5$
	22	$>10^4$	10^4	++++	0	++++	+++	$>10^5$	$>10^5$
6 C.	3	4	5	+	+	0†	++†	9	11
	10	2	3	14	12	0	0	16	40
	22	0	1	+	+	0	0	>200	>600

* Test was repeated. No bacteria were recovered on third day or subsequent days. † Test was repeated. Bacteria were recovered on third day but none on subsequent days. ++++, +++, ++, + = innumerable, very many, moderate number and few bacteria.

TABLE 2.—*The Influence of 0.2 per Cent Sodium Sulfathiazole on Bacteria in Human Serum Which Had Previously Been Pooled, Frozen and Dried in an Approved Manner*

Bacterium		Staphylococcus aureus		Pseudomonas aeruginosa		Bacillus subtilis		Streptococcus viridans	
Inoculum		16 Bacteria/Cc.		Approximately 10 Bacteria/Cc.		Approximately 10 Bacteria/Cc.		2 Bacteria/Cc.	
	Days	Control, 1 Cc.	Drug, 1 Cc.	Control, 1 Cc.	Drug, 1 Cc.	Control, 1 Cc.	Drug, 1 Cc.	Control, 1 Cc.	Drug, 1 Cc.
37 C.	3	++++	$>10^2$	++++	++++	++++	++++	4	1
	10	++++	+++	++++	Contaminated	++++	++++	0	0
	30	++++	+++	++++		++++	++++	0	0
22 C.	3	++++	+++	++++	+++	++++	++++	Contaminated	3
	10	++++	+++	++++	+++	++++	++++	..	3
	30	++++	+++	++++	+++	++++	++++	..	0
6 C.	3	2	12	+	+	0	0	4	7
	10	12	12	+	+	0	Contaminated	8	7
	30	0	2	+	+*	0	..	3	6

* Six days elapsed before growth was present in this subculture.

TABLE 3.—*Influence of 0.2 per Cent Sodium Sulfathiazole on Bacteria in Pooled Citrated Blood from Four Donors*

Bacterium	Bacteria Added per Cc.	Bacteria Recovered per Cubic Centimeter: Control 2 Hrs.	Control 24 Hrs.	Control 48 Hrs.	Control 72 Hrs.	0.2% Sodium Sulfathiazole 2 Hrs.	0.2% Sodium Sulfathiazole 24 Hrs.	0.2% Sodium Sulfathiazole 48 Hrs.	0.2% Sodium Sulfathiazole 72 Hrs.
Staphylococcus albus	18	9	15	9	16	8	23	13	6
	180	125	105	84	63	103	130	83	61
Staphylococcus aureus	8	3	9	10	6	10	13	16	8
	80	85	77	86	67	79	100	73	57
Streptococcus bovis	6	8	13	7	5	15	20	14	8
	60	72	81	76	97	65	117	76	72

In view of the present interest in human plasma for use in both military and civilian medicine, Dr. Novak's report will attract widespread attention. Particularly is this true since so many laboratories and clinics are eagerly awaiting methods which offer simplification of the complicated and exacting procedures required for safely processing plasma. My attention was called to this report by the author's results being at wide variance with other available data. Because of the urgency of the problem, Dr. Margaret Pittman was assigned the task of checking Dr. Novak's work as nearly as could be done from reading his report. Dr. Pittman's report follows:

Two different experiments have been done, one with pooled liquid human plasma and the other with restored frozen and dried human serum. With each a concentration of 0.2 per cent sodium sulfathiazole was used. Tubes containing the plasma hence no growth developed. The pooled liquid plasma was inoculated with Staphylococcus aureus, Pseudomonas aeruginosa (pyocyaneus), Bacillus subtilis and Streptococcus bovis (isolated from frozen and dried cow serum); the restored dried serum was inoculated with the first three species and Streptococcus viridans. The results are given in tables 1 and 2.

At 37 and 22 C. the staphylococci rapidly multiplied in the presence of the drug in both the plasma and the serum; the rate of growth, however, was slower than in the control tubes. Nevertheless, at the end of twenty-two days 10^4 bacteria per cubic centimeter were counted in the plasma containing drug at both temperatures. Contrasting results were obtained with P. aeruginosa in the liquid plasma and in the restored serum. In the liquid plasma with the drug at 37 and 22 C. no bacteria were recovered; at 6 C. they were recovered through the twenty-second day. In this instance Dr. Novak's observations

were confirmed. However, in the restored serum with the drug there was rapid multiplication of this bacterium in the presence of the drug.

B. subtilis grew in both the plasma and the serum at 37 and 22 C. but at 6 C. it could not be recovered from the tubes with or without the drug after the third day. The tube of plasma plus the drug at 37 C. was lost after the third day of culturing, and another tube was set up with plasma of the same lot but from another bottle. Bacteria could not be recovered from this tube, while in the control tube there was luxuriant growth.

With Str. bovis in the plasma there was not the slightest indication of bacteriostasis; in fact there was some indication that the drug acted as a stimulant.

Str. viridans did not multiply in the restored serum with or without the drug but it was recovered in equal number from serum containing the drug and from the control tubes over the same time interval.

An additional experiment was made with pooled citrated blood. Concentrations of 0.02 and 0.2 per cent sodium sulfathiazole were used. The bacteria added were Staph. aureus and Str. bovis used in the preceding experiments and a Staphylococcus albus isolated two days previously from human skin. The inoculated tubes were held at 5 C. and cultured at different intervals up to seventy-two hours. At no time was there any significant difference in the number of bacteria recovered from the blood containing either amount of the drug as compared with the number from the blood containing no drug. The results obtained when 0.2 per cent of the drug was used are given in table 3.

Dr. Pittman's report is not intended as a complete study of bacteriostatic or bactericidal influence of the sulfonamide drugs when dissolved in normal human plasma. However, using five different species of bacteria and one lot of pooled plasma and one of serum, and after exposing the bacteria to the drug-treated plasma or serum at three different temperature levels, and culturing three times during a period of approximately thirty days, she was unable to find any evidence that 0.2 per cent sodium sulfathiazole had an inhibiting effect to a degree to be of significance when used in processing plasma or serum. Since this study was undertaken, Heath and Province (THE JOURNAL, March 28, p. 1034) have reported their observations, which confirm Pittman's results.

This study was repeated with whole blood in order to ascertain whether the action of sodium sulfathiazole would be different in the presence of the cellular elements of the blood. Here again the drug failed to exert any retarding action on the bacteria used and under the conditions of the test as described by Dr. Pittman.

It is regrettable that Dr. Novak should hold (paragraph 2 of his conclusions) that the addition of 0.2 per cent sodium sulfathiazole to the bleeding bottle is justification for indifferent technic in drawing blood or in recovering the plasma. Up until now there is no known acceptable bactericidal agent which will accomplish this. On the other hand, qualified technicians using the aseptic bleeding technic, followed by a closed system of processing the plasma, can produce a sterile product even on large scale production. This is being illustrated in the present program of collecting blood and processing it to the dried plasma for the armed forces. Operating under the minimum requirements specified by the National Institute of Health for licensed laboratories, one bleeding clinic (under Red Cross auspices) has, to date, delivered 6,606 consecutive uncontaminated bleedings. Two processing laboratories which receive blood from this and seven other bleeding clinics have to date processed to the dried state 60,685 bleedings with a loss of 286 bleedings, or 0.47 per cent, because of contamination. Some bleeding clinics and processing laboratories where less regard is given to essential details have records less good. We have yet to find the easy short cut to preparing uncontaminated citrated normal human plasma.

M. V. VELDEE, M.D., Washington, D. C.
Chief, Division of Biologics Control,
National Institute of Health.

THROMBOSIS OF RENAL ARTERY SIMULATING CORONARY THROMBOSIS

To the Editor:—In their paper "Thrombosis of Renal Artery Simulating Coronary Thrombosis" (THE JOURNAL, May 2, p. 27) Drs. Wolffe and Donnelly state "The clinical manifestations of renal artery thrombosis are as yet not well recognized. . . . There is no complete description, as far as we can find, in any textbook or periodical of the clinical manifestations of thrombosis of the renal artery." I should like to call their attention to a paper published by me in the *Archives of Internal Medicine* in April 1908 on "Clinical Manifestations of Hemorrhagic Renal Infarct." The clinical signs and symptoms of thrombosis of the renal artery are there described and discussed in great detail. In my study of the literature on the subject at that time I found descriptions of the syndrome characterized by that painstaking attention to physical signs so characteristic of the masters of the art of diagnosis of the era when urography was unknown. I have reference to the contributions on the subject by Traube, Leube, Senator, von Recklinghausen and particularly Rudolph Schmidt, who reported 3 cases from Neusser's clinic, all of which he diagnosed ante mortem. I had the good fortune to study and to report the first case in English literature. The historical value of my case may be somewhat enhanced, at least to American readers, by the fact that my two consultants in the case each were outstanding figures, one in internal medicine, the other in surgery. I have reference to Bertram W. Sippy and John B. Murphy. Evarts Graham was the intern on the case. The gross specimens were presented to the Pathologic Museum of the Rush Medical College.

GEORGE HALPERIN, M.D., Chicago.

SULFANILAMIDE FAST GONOCOCCI

To the Editor:—In an editorial in THE JOURNAL, May 2, "Sulfanilamide Fast Gonococci," the writer refers to the publications of Boak, Westphal, Carpenter, Bang, Mahoney and others. He concludes from the possibility of artificially fastening gonococcus strains to sulfanilamide or sulfapyridine, and the failure of attempts to fasten them to sulfathiazole, that "the failure of the gonococcus to develop resistance to sulfathiazole suggests that sulfathiazole fast strains are not likely to be developed in the clinic or to be spread to the general population."

The author apparently overlooked the recent publication of my associates and myself on the behavior of various gonococcus strains to sulfathiazole (Cohn, Alfred; Steer, Arthur, and Seijo, Irma: Correlation Between Clinical and In Vitro Reactions of Gonococcus Strains to Sulfathiazole, *Am. J. M. Sc.* **203**:276 [Feb.] 1942). With the method described in the article we have been able to demonstrate the existence of gonococcus strains naturally resistant to sulfathiazole both in vitro and in vivo. There was a close correlation between the clinical response of the patient to the drug and the reaction of the strain to sulfathiazole in the test tube.

ALFRED COHN, M.D., New York.

ARMY NURSE CORPS

To the Editor:—The story "The Army Nurse Corps" in the April 18 issue, page 1374, is incomplete. Women trained nurses entered the United States Army Medical Service in August 1898 at Montauk, N. Y. The deaths at the General Hospital where I was executive officer averaged fifteen a day. Nursing was our great need. Through Howard Townsend, Red Cross executive at Montauk, I asked President McKinley for these nurses. Authority was at once given. During the period left out in your article nurses served in the United States, in the Philippines, in Cuba and in Puerto Rico; also on the hospital ship *Relief*. It seems too bad that the pioneer nurses should not be given credit for the heroic work done then and since.

IRA C. BROWN, M.D., Seattle.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 15-16, 1943. Sec., Council on Medical Education and Hospitals, Dr. H. G. Weiskotten, 535 North Dearborn Street, Chicago.

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, May 30, page 439.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 16-18. Acting Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, July 7-8. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: *Written.* San Francisco, June 29-July 2. *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, June 17. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

COLORADO: * Denver, July 7-10. Application must be on file not later than June 21. Sec., Dr. George R. Buck, 831 Republic Bldg., Denver.

CONNECTICUT: * *Medical,* Hartford, July 14-15. *Endorsement.* Hartford, July 28. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, July 14-15. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 14-16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: * Jacksonville, June 22-23. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta and Augusta, June. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, July 13-16. Sec., Dr. James A. Morgan, 55 Young Bldg., Honolulu.

ILLINOIS: Chicago, June 23-25. Superintendent of Registration, Mr. Philip M. Harman, Department of Registration and Education, Springfield.

INDIANA: Indianapolis, June 16-18. Sec., Board of Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

MAINE: Augusta, July 7-8. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, June 9-12. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 16-17. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 14-17. Sec., Dr. H. Q. Gallupe, 413-F State House, Boston.

MINNESOTA: * Minneapolis, June 16-18. Sec., Dr. Julian F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSISSIPPI: Jackson, June 24-25. Assistant Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: Helena, Oct. 6. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEBRASKA: * Omaha, June 8-10. Dir., Bureau of Examining Boards, Mrs. Jeannette Crawford, 1009 State Capitol Bldg., Lincoln.

NEW HAMPSHIRE: Concord, Sept. 10-11. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, June 16-17. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 22-25. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 22. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, July 7-10. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* July 7. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: * Portland, July 22-24. Application must be on file not later than July 9. Exec. Sec., Miss Lorienne M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 7-11. Act. Sec., Bureau of Professional Licensing, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

RHODE ISLAND: * Providence, July 2-3. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia: June 22-24. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: * Pierre, July 21-22. Dir., Medical Licensure, Dr. J. F. D. Cook, State Board of Health, Pierre.

TENNESSEE: Knoxville, Memphis and Nashville, June 17-20. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

UTAH: Salt Lake City, June 29-30. Assistant Dir., Department of Registration, Mr. G. V. Billings, 324 State Capitol Bldg., Salt Lake City.

VERMONT: Burlington, June 16-18. Sec., Board of Medical Registration, Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, June 17-20. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WEST VIRGINIA: Charleston, July 6-8. Commissioner, Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

WISCONSIN: * Milwaukee, June 30-July 3. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, June 16. Sec., Mr. Franklin E. Roach, Science Hall, University of Arizona, Tucson.

CONNECTICUT: June 13. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

MICHIGAN: Ann Arbor and Detroit, June 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

NEW MEXICO: Springer, June 12. Sec., Miss Pia Joerger, State Capitol, Santa Fe.

OREGON: Corvallis, July 11. Application must be on file not later than June 24. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals: Liability for Electric Lamp Burn.—The plaintiff was admitted to the defendant hospital one morning preparatory to undergoing an operation. Sometime during the afternoon a hospital attendant attached an electric lamp and reflector to the bedstead at the foot of the plaintiff's bed. The lamp was attached by means of hooks similar to the ear bows of eye glasses. The operation was performed about 8 o'clock in the evening, under a spinal anesthetic, and the plaintiff was returned to his room an hour or so later. In the middle of the night the plaintiff complained of a burning sensation in his feet. When the bed clothes were removed a nurse discovered the lamp which had formerly been attached to the foot of the bed. The plaintiff's foot had been seriously burned. Subsequently the plaintiff sued the defendant hospital for damages on account of the injuries sustained as a result of the alleged negligence of the defendant's servants. The trial court refused to submit the case to the jury and dismissed the plaintiff's complaint, so the plaintiff appealed to the Court of Appeals of New York.

The defendant contended that the trial court ruled correctly in dismissing the complaint because the plaintiff had not produced sufficient evidence to warrant the submission of the case to the jury. It argued that the plaintiff had not negatived the possibility that the burn was caused by his own negligence or that of some one for whose actions the defendant hospital was not responsible. It also insisted that there was no proof that the burns were caused by the lamp. The Court of Appeals said that circumstantial evidence was sufficient if it supported the inference of causation, even though it did not negative the existence of a remote possibility that the injury was not caused by the defendant. The plaintiff's evidence, said the court, was sufficient, if believed, to show that the plaintiff was not burned when he was put to bed after the operation; that he felt the burn later, that the lamp was removed from under the bed clothes and that the burn was of the kind which could be caused by the lamp in question. Furthermore, said the court, it was unreasonable to assume that some complete stranger, or even the plaintiff's physician, entered the plaintiff's room during the operation and tampered with the bed lamp. The court therefore concluded that the plaintiff's evidence negatived all but the barest possibility that the defendant was free from negligence and held that the case should have been submitted to the jury. The court also held, although the defendant claimed no immunity because of its charitable nature, that it is now well settled in New York that even a charitable hospital is liable for the acts of its servants. Judgment for the defendant was accordingly reversed and a new trial granted.—*Dillon v. Rockaway Beach Hospital & Dispensary, 30 N. E. (2d) 373 (N. Y., 1940).*

Medical Services: Right of Court to Order Operation on Child.—Section 85 of the Domestic Relations Court Act of the city of New York provides that whenever a child within the jurisdiction of the court and "under the provisions of this act appears to the court to be in need of medical or surgical care a suitable order may be made for the treatment of such child in its home, in a hospital or other suitable institution." The child involved in this case, a 10 year old girl, suffered from a deformity of her right leg induced by poliomyelitis, and an operation to correct it was necessary. The mother desired that the operation be performed but the father refused his permission. On petition of the mother, the case came before the domestic relations court of the city of New York, children's court, Kings County.

It was doubtful, the court said, whether under the common law a court had the power to order treatment for children to the extent of even a surgical operation or to require that parents do that which is promotive of the interests and is protective of the rights of a child. There has been an emergence, however, from that period in the history of man and its prejudices, biases

and limitations of a community interest in the child population have been left behind. The law is a growth; otherwise it could not serve the purposes of man and his needs. Like life, the law constantly undergoes change. Law is instituted among man for the protection of the individual against the community, as well as for the protection of the community against the individual. It also protects children against parents when there is neglect. The physical well-being of children is the basis for the moral care, proper training and guidance. A child, the court pointed out, deprived of the use of its limb and the limb becoming progressively worse cannot have a sense of security. It feels itself different from others. It suffers from a sense of rejection. It cannot take its proper place in the group in which it lives. To the extent that medical science can correct the deformity or the limitation of the use of the limb, that service should be accorded. When the legislature devolved on the court the power to make an order for surgical care, the court said, it cannot be said that an order is to be made only in a case in which the parents consent to such an order. The court may order an operation not only in an instance in which the life of the child is to be saved but also in instances in which the health, the limb, the person and the future of the child are at stake.

A report submitted to the court by the New York Orthopedic Hospital specifically stated that an operation was necessary to correct the deformity from which the child was suffering and which was becoming aggravated. Three physicians testified to the need for the operation. The father of the child testified in opposition to the operation. He gave no reason for his opposition. On all the testimony submitted there was no doubt in the mind of the court that a successful operation would correct the condition, and in the opinion of the court it was in the best interests of the child that the operation be performed. The court therefore entered an order accordingly.—*In re Rotkowitz, 25 N. Y. S. (2d) 624 (N. Y., 1941).*

Governmental Hospitals: Liability for Negligence of Agent in Performance of Administrative Duties.—The plaintiff, who was engaged as a nurse in the Bellevue Hospital at a salary of $90 a month plus "board, maintenance and proper medical and surgical attention" became ill while on duty and was sent to the nurses' infirmary. To stop the vomiting and nausea from which she was suffering a physician prescribed hypodermic injections of Magendie's solution. Four injections in the upper part of her left arm were administered by various nurses on duty in the infirmary. In a few days her arm commenced to swell and became painful at the place at which the injections had been made. Although an operation, as well as numerous lancings, was performed, the plaintiff finally lost practically the entire use of the arm and hand. In a subsequent suit by the plaintiff against the city of New York, owner of the Bellevue Hospital, a public institution, to recover damages for the injury sustained, a witness for the plaintiff testified that Magendie's solution is an aqueous solution of morphine sulfate and is subject to decomposition in three or four days. This witness further stated that when the solution is freshly prepared it is colorless but as it decomposes it changes to a yellowish brown and finally to dark brown. The plaintiff testified that the fourth injection put into her arm was of a brownish liquid. The evidence also showed that the hospital nurse supervisor had, for at least six months before the plaintiff received the injections, been aware of the state of decomposition of the solution and had pronounced it unfit for use. It was not destroyed, however, but was retained in the drug cabinet with the request by the supervisor that it not be used. From a subsequent judgment for the plaintiff in the trial court and its reversal by the supreme court, appellate division, the plaintiff appealed to the Court of Appeals of New York.

The defendant first contended that the plaintiff was not entitled to maintain this action against the city because her sole and exclusive remedy was under the workmen's compensation act. The Court of Appeals held, however, that the risk of the injury suffered by the plaintiff was not incidental to her employment as a nurse but was a risk to which any one receiving such treatment in a hospital would be subjected. Since the occurrence of the injury was not made more likely because of her employment, the injury did not arise out of and in the course of employment and was, therefore, not subject to the provisions of the compensation act.

The defendant next contended that the negligence complained of was that of the nurse who administered the solution acting in her professional capacity rather than in the performance of a mere administrative act on behalf of the hospital. It was conceded that the doctrine of respondeat superior is not applicable between nurses engaged in professional tasks in the treatment of patients in a hospital, and their employer; yet if a hospital is negligent in the performance of an administrative function, it is liable in damages. The plaintiff did not contend that there was any negligence in the administration of the injection; she contended that the hospital was negligent in allowing decomposed medical supplies to be made available for use. The Court of Appeals said that among the administrative duties of a hospital was the providing of proper and necessary food and medicine. The court therefore held that the supervisor, having known for six months that the Magendie's solution was stale, was obligated to see that it was either removed or destroyed and a fresh solution supplied. Her failure in that respect, was a failure of the hospital in an administrative capacity for which the owners were liable.

Finally, the defendant contended that it was immune from liability because in the operation of the Bellevue Hospital it was exercising a governmental function. The Court of Appeals admitted that when a city furnishes medical and surgical treatment to those of its citizens who cannot afford to pay it is performing a governmental function. The infirmary in which the plaintiff was treated, however, was not operated for the benefit of the public; it was open only to nurses. Furthermore, the plaintiff was not a recipient of charity but was, in effect, a pay patient since part of her salary as a nurse in the Bellevue Hospital was "proper medical and surgical attention." The infirmary was, therefore, maintained in the performance of a contractual duty and not as either a governmental obligation or a public health measure.

Accordingly the judgment of the appellate division was reversed and that of the trial court in favor of the plaintiff affirmed.—*Volk v. City of New York, 19 N. Y. S. (2d) 53; 30 N. E. (2d) 596 (N. Y., 1940).*

Society Proceedings

COMING MEETINGS

American Medical Association, Atlantic City, N. J., June 8-12. Dr. Olin West, 535 North Dearborn Street, Chicago, Secretary.

American Association for the Study of Allergy, Atlantic City, N. J., June 8-9. Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Texas, Secretary.

American Broncho-Esophagological Association, Atlantic City, N. J., June 8-9. Dr. Paul H. Holinger, 700 North Michigan Blvd., Chicago, Secretary.

American College of Chest Physicians, Atlantic City, N. J., June 6-8. Dr. Paul H. Holinger, 500 North Dearborn St., Chicago, Secretary.

American Diabetes Association, Atlantic City, N. J., June 7. Dr. Cecil Striker, 630 Vine Street, Cincinnati, Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., June 8-9. Dr. J. Arnold Bargen, 102 Second Ave. S.W., Rochester, Minn., Secretary.

American Gynecological Society, Skytop, Pa., June 15-17. Dr. Howard C. Taylor Jr., 842 Park Ave., New York, Secretary.

American Human Serum Association, Atlantic City, N. J., June 8. Dr. William L. Wheeler, 348 West 22d St., New York, Secretary.

American Medical Women's Association, Atlantic City, N. J., June 6-7. Dr. Ada Chree Reid, 102 East 22d St., New York, Secretary.

American Physiotherapy Association, Lake Geneva, Wis., June 28-July 3. Miss Evelyn Anderson, Stanford University, Calif., Secretary.

American Proctologic Society, Atlantic City, N. J., June 7. Dr. William H. Daniel, 1930 Wilshire Blvd., Los Angeles, Secretary.

American Radium Society, Atlantic City, N. J., June 8-9. Dr. Axel N. Arneson, 4952 Maryland Ave., St. Louis, Secretary.

American Rheumatism Association, Atlantic City, N. J., June 8. Dr. A. R. Shands, Dupont Institute, Wilmington, Del., Secretary.

Association for the Study of Internal Secretions, Atlantic City, N. J., June 8-9. Dr. Henry H. Turner, 1200 North Walker St., Oklahoma City, Secretary.

Maine Medical Association, Poland, June 21-23. Dr. Frederick R. Carter, 142 High Street, Portland, Secretary.

Minnesota State Medical Association, Duluth, June 29-July 1. Dr. B. B. Souster, 493 Lowry Medical Arts Bldg., St. Paul, Secretary.

Montana, Medical Association of, Missoula, July 8-10. Dr. Thomas F. Walker, 206 Medical Arts Bldg., Great Falls, Secretary.

New Mexico Medical Society, Santa Fe, June 25-28. Dr. L. B. Cohenour, 221 W. Central Avenue, Albuquerque, Secretary.

Pacific Northwest Medical Association, Portland, Ore., June 17-20. Dr. C. W. Countryman, 407 Riverside Ave., Spokane, Secretary.

West Virginia Medical Association, White Sulphur Springs, July 13-15. Mr. Charles Lively, 1031 Quarrier St., Charleston, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

11:293-336 (March) 1942

Respiratory Obstruction. G. E. Fisher, Birmingham.—p. 293.
Epidemiology of Acute Anterior Poliomyelitis. J. M. Kimmey, Anniston. —p. 295.
Infant Feeding: Principles and Problems in General Practice. A. Wilkerson, Marion.—p. 297.
Acute Indigestion. H. M. Simpson, Florence.—p. 298.
Alabama's Industrial Hygiene Program. E. H. Place, Birmingham. —p. 301.

American Heart Journal, St. Louis

23:147-290 (Feb.) 1942

Peripheral Circulatory Failure. A. Blalock, Baltimore.—p. 147.
Cardiology as Specialty. P. D. White, Boston.—p. 161.
Effect of Sex Hormones on Production of Ergotamine Gangrene in Rats. E. Krueger, J. B. Ludden and I. S. Wright, with technical assistance of J. Wiland, New York.—p. 164.
*Rheumatic Carditis in Tropical Country. E. G. Carrillo, San José, Costa Rica.—p. 170.
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Study of Rate of Water Loss from Surfaces of Finger Tips and Toe Tips of Normal and Senile Subjects and Patients with Arterial Hypertension. G. E. Burch, A. E. Cohn and C. Neumann, New York. —p. 185.
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*Syphilitic Cardiovascular Disease and Bacterial Endocarditis. S. Koletsky, Cleveland.—p. 208.
Lumbar Sympathectomy in Treatment of Intermittent Claudication: Selection of Cases by Claudication Test with Lumbar Paravertebral Procaine Injection. N. E. Freeman and H. Montgomery, Philadelphia. —p. 224.
Cedilanid, with Special Reference to Its Intravenous Use. M. Sokolow and F. L. Chamberlain, San Francisco.—p. 243.
Clinical Experience with Oral Administration of Cedilanid, and Comparison of Oral and Intravenous Preparations of Cedilanid with Digitalis Purpurea. F. L. Chamberlain and M. Sokolow, San Francisco.—p. 245.
Acute Pericarditis Simulating Acute Coronary Occlusion: Report of Fourteen Cases. A. R. Barnes and H. B. Burchell, Rochester, Minn. —p. 247.

Rheumatic Carditis in Tropical Country.—Carrillo encountered from April 1936 to April 1939 22 cases of rheumatic fever, chorea and endocarditis among 3,771 clinical records from the pediatric ward of the Hospital San Juan de Dios, at San José. Electrocardiograms were not made and it is possible that other cases were not noticed. The incidence of mitral stenosis in the last thousand necropsies performed at the hospital during the five years preceding May 1941 was 1.1 per cent. Climate alone should not be given undue importance in the etiology of rheumatic infection, as other factors may play a determining role in the evolution and the cardiac sequelae of the disease.

Syphilitic Cardiovascular Disease.—The frequency with which syphilitic heart disease and bacterial endocarditis are associated was ascertained by Koletsky in reviewing 4,000 consecutive necropsies performed at the University Hospitals of Cleveland. The study revealed 5 cases with a diagnosis of cardiovascular syphilis and bacterial endocarditis. In four of these hearts stigmas of rheumatic fever were also present, and in at least two there was a combined syphilitic and rheumatic lesion of the aortic valve. In the fifth case syphilis was confined to the root of the aorta, and the acute bacterial endocarditis was apparently superimposed on a normal aortic valve. These observations do not support the belief that syphilis is a significant predisposing factor in bacterial endocarditis.

American Journal of Medical Sciences, Philadelphia

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*Use of Sulfanilamide in Treatment of Acute Glomerular Nephritis. R. H. Williams, Boston; W. T. Longcope, Baltimore, and C. A. Janeway, Boston.—p. 157.
Effect of Various Sulfonamides on Hemolytic Staphylococcus Measured with Manometric Technic. W. Kempner, C. Schlayer and P. Summers, Durham, N. C.—p. 172.
*Cavity Healing and Bronchial Occlusion. W. Pagel and F. A. H. Simmonds, London, England.—p. 177.
Hypoprothrombinemia in Pernicious Anemia. E. D. Warner and C. A. Owen, Iowa City.—p. 187.
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Prolongation of PR Interval in Patients with Paroxysmal Auricular Fibrillation and Flutter Following Myocardial Infarction. M. J. Klainer and M. D. Altschule, Boston.—p. 215.
Justification for Increasing Use of Electrocardiography in Hospital Practice. A. J. Geiger, M. Calabresi and L. F. Blaney, New Haven, Conn.—p. 219.
*Danger of Procrastination in Biliary Tract Disease Until Irreversible Liver and Kidney Changes Occur. A. O. Wilensky, New York.—p. 231.
Agnogenic Congenital Clubbing of Fingers and Toes. H. B. Thomas, York, Pa.—p. 241.
Standardization of Congo Red Test for Amyloidosis. A. Taran and A. Eckstein, Staten Island, N. Y.—p. 246.
Effect of Diet and Meals on Maximal Urea Clearance. L. P. Longley and M. Miller, Cleveland.—p. 253.
Bronchopneumonia of Unknown Etiology in Girls' School. W. B. Daniels, Washington, D. C.—p. 263.
Correlation Between Clinical and In Vitro Reactions of Gonococcus Strains to Sulfathiazole: Preliminary Report. A. Cohn, A. Steer and Irma Seijo, New York.—p. 276.
Formol Gel Test in Rheumatic Fever. J. S. Butterworth and C. A. Poindexter, New York.—p. 278.

Sulfanilamide in Acute Glomerular Nephritis.—Williams and his associates compared the course of acute hemorrhagic nephritis in 42 patients treated with sulfanilamide and 108 patients similarly treated but not given the drug. In the subjects receiving sulfanilamide foci of infection cleared up more rapidly, signs of renal damage disappeared more rapidly, the nephritic exacerbations following tonsillectomy occurred less frequently, the duration of edema and hypertension was shorter and the incidence of clinical recovery was greater. One of the 42 patients treated with sulfanilamide died in the acute stage of the disease. Recovery was complete in 15 of the 33 who returned for observation after six months and in 29 of the 39 followed for at least two years. Three other patients followed for only a few weeks are in a quiescent stage. Five of the 39 patients are in the quiescent stage and 2 are in a progressive stage. Conversely there were 12 deaths during the acute stage among the 108 patients and 5 deaths following a pregression to chronic nephritis. Only 56 patients recovered completely, 11 are in the quiescent stage and 24 are in the chronic progressive stage of the disease. The immunologic reactions, as exemplified by the antistreptolysin titer of the blood serum, have been practically the same in the two groups of patients. There was no evidence that sulfanilamide caused renal damage.

Cavity Healing and Bronchial Occlusion.—Pagel and Simmonds state that three anatomic forms of healed cavities can be differentiated at roentgen study or at necropsy: (1) the solid focus due to retention, inspissation and final calcification of the cavity contents, (2) the radiating scar and (3) the bronchiectatic area remaining after the caseous and tuberculous elements in the wall of the cavity are replaced by ordinary granulation tissue, with subsequent epithelization and fibrous shrinking of the space. Six examples of cavity healing by conversion of the space into a solid, caseous and calcifying focus are presented. At necropsy no cavity could be traced, but corresponding in shape, size and location there was a caseous nodule resembling an ordinary "round focus." Various stages of the development were represented by the 6 cases. Regarding the frequency of the three anatomic forms of cavity healing, the authors have encountered 11 of these, and only 2 of them presented healing of the wall of the cavity with persistent cavitation, while 9 were instances of cavity closure by conversion into a caseous or calcifying nodule. The incidence (16 cases) is approximately the same when the 33 cases (including the authors' 11) reported in the literature are analyzed. This frequency of cavity healing by conversion into a solid

focus vindicates the assumption made by many clinicians that a calcified nodule often represents the last remnant of a healed cavity. Why some cavities heal by scar formation and others by conversion into a solid nodule is a matter of speculation. The following tentative explanation is advanced: In the authors' cases pneumothorax was the therapy used; following the operation there may be a rapid closure of the bronchus which has already been partially obstructed by caseation. The thick caseous lining of the cavity does not have time to be discharged or to become absorbed, but absorption of the air in the cavity allows a collapse and the caseous lining appears as a solid encapsulated focus. When the bronchus is more patent, drainage is more free and there is less material to form a solid nodule. The closure of the cavity also may then be a slower process and be accomplished by concentric shrinking of the wall of the cavity by fibrosis and obliteration of the lumen with final scar formation. Four weeks appears to be the minimal time required for cavities to heal.

Biliary Tract Disease.—Wilensky has observed that the prognosis in obstruction of the common bile duct is favorable, provided infection of the biliary tract does not set in. Once infection gains a foothold, whether the obstruction is relieved or not, frequently the course is rapidly downhill. Subsequent operative release of the obstruction is often too late to reverse the preceding sequence of events. The resulting cholangiohepatitis does not appear to be due to any particular bacterial organism, although it is probably derived from the alimentary canal. The quantitative extent to which the hepatic parenchyma is functionally involved will determine the final outcome, but frequently there are no recognizable corresponding anatomic changes. Infection in the biliary radicals is not the only means of causing sufficient hepatic damage to produce the terminal picture, for direct trauma with pulpification of the liver and other mechanisms have produced the liver-kidney syndrome. In his cases the characteristic changes were degenerative alterations in the renal tubules and at times in the glomeruli, with occasional hemorrhages in the renal parenchyma. He saw 1 patient with miliary abscesses. Myocardial changes, when present, were also of a degenerative nature. A severe degree of periportal cellular necrosis of the liver was present in all cases.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

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*Treatment of Cancer of Tongue. G. E. Richards, Toronto, Canada. —p. 191.
Tumor Response to Roentgen Irradiation as Influenced by Host-Tumor Relation. A. W. Oughterson, J. Plaut and E. A. Lawrence, New Haven, Conn.—p. 207.
Dosage Determinations with Radioactive Isotopes. L. D. Marinelli, New York.—p. 210.
*Treatment of Lymphosarcoma with Radioactive Phosphorus: Preliminary Report. J. M. Kenney, L. D. Marinelli and L. F. Craver, New York.—p. 217.
Relation of Phosphatase Activity in Bone Tumors to Deposition of Radioactive Phosphorus. Helen Q. Woodard and J. M. Kenney, New York.—p. 227.
Roentgenologic Manifestations of Tumors of Small Intestine. H. M. Weber and B. R. Kirklin, Rochester, Minn.—p. 243.
*Hemorrhage from Gastritis: Report Based on Pathologic, Clinical, Roentgenologic and Gastroscopic Findings. E. B. Benedict, Boston. —p. 254.
Diagnosis of Gastric Cancer: Analysis of Gastroscopic and Roentgenologic Findings. F. E. Templeton and R. C. Boyer, Chicago.—p. 262.
Roentgenographic Study of Craniofacial Dysostosis: Report of Cases; Nonfamilial and Nonhereditary. M. Arce and F. Arce, Madrid, Spain.—p. 275.
Riblike Shadows in Gluteal Muscles Produced by Oil Suspension of Bismuth Used in Antisyphilitic Therapy. J. W. Lawlah, Washington, D. C., and H. M. Pollack, Chicago.—p. 291.
Bronchocolic Fistula: Report of Case. A. J. Ackermann, Oklahoma City.—p. 294.
Internal Biliary Fistula. P. J. Delano, Chicago.—p. 298.
Differentiation Between Direct and Indirect Effects of Roentgen Rays on Organs of Normal and Adrenalectomized Rats. C. P. Leblond, Montreal, Canada, and G. Segal, Rochester, N. Y.—p. 302.
Foreign Body Localization as Provided with United States Army Table Unit. A. A. de Lorimier, Washington, D. C.—p. 307.

Treatment of Cancer of Tongue.—Richards considers the first essential step toward a better understanding of the general problem of the treatment of cancer of the tongue to be the adoption of some uniform classification which would at least bring into one group those patients for whom there is reasonable hope of cure. Of approximately 200 cases of cancer of the tongue that he treated during the last ten years, 167 have been analyzed in some detail and classified into four groups with primary lesions (according to size) and into three groups with secondary lesions (according to the extensiveness of the metastasis). In treating and handling cancer of the tongue the avoidance of traumatism is as essential as is asepsis in general surgery. The policy has been to complete the treatment of the primary lesion before the secondary involvement, if such is present, is treated, usually by neck dissections if the primary lesion can be or is likely to be controlled. When neck dissection is not advisable, irradiation of secondary involvement has been carried out concurrently with that of the primary lesion. When the diagnosis of a primary lesion has been verified and the mouth prepared by careful oral hygiene, treatment is begun by external roentgen irradiation at 400 kilovolts or with the radium bomb containing 4 to 5 Gm. of radium. With either of these forms of irradiation effective control of the lingual cancer can be secured provided tumor doses (5,500 roentgens) are delivered to the entire tumorous area. Roentgen rays at this voltage appear somewhat more satisfactory than radium. The other factors employed are a composite filter equivalent to 6 mm. of copper, with a half value layer of 4.5 to 5 mm. of copper and an intensity of 7 to 10 roentgens per minute. The skin distance is 100 to 110 cm. The depth dose at 10 cm. is 36 per cent. Each treatment represents a dose of 200 roentgens delivered in forty minutes. Allowing for individual variations, fully established tissue reactions will be reached at total doses of 2,100 to 4,500 roentgens per port in approximately four weeks. When about half of the external dose has been administered, the irradiation is supplemented by intraoral irradiation, for which roentgen rays at 200 kilovolts through an intraoral cone at 43 cm. distance are used. The daily dose from this source is 280 roentgens, and approximately 3,000 roentgens is delivered within two weeks. Thus the final tissue reaction produced in the tongue is the summation of the external and intraoral radiation, which should reach maximal intensity simultaneously. If after the tissue reaction has subsided completely all visible and palpable evidence of the primary lesion has disappeared, no further treatment is given. If there is evidence of residual disease, radium in reduced doses is applied by the interstitial method. Of 119 patients treated three or more years ago 37 per cent are living and are free from disease; 27 per cent are living and free from disease for five or more years. Palpable lymph nodes have never developed in 60 of these 119 patients. The three year survival rate for these 60 patients is 63.3 per cent, and the five year rate is 49 per cent without recurrence to date. Clinically, of 19 patients with a primary lesion in stage 1 all were "controlled," of 78 with stage 2 lesions 67, or 78 per cent, were "controlled," of 67 with stage 3 lesions 40, or 54 per cent, were "controlled" and of 27 with stage 4 lesions 4, or 13 per cent, were "controlled."

Radioactive Phosphorus for Lymphosarcoma.—Kenney and his collaborators administered tracer doses of radioactive phosphorus to 18 patients with lymphosarcoma. From one to thirty-one days later a lymph node was excised from each patient and its radioactivity was measured and corrected for decay to the date of administration of the radioactive phosphorus. The average lymph node invaded by lymphosarcoma had a differential absorption ratio of about 3. Application of suitable formulas for estimating the amount of radiation that might be delivered to such tissue indicated that radioactive phosphorus might be a useful therapeutic agent for this disease. Courses of 70 to 100 microcuries of radioactive phosphorus per kilogram of body weight were administered in divided doses every seven to fourteen days. Of the 18 patients who have been or are being treated, 5 have had complete regression of all evidence of disease and have been free from recurrence for one to eight months, 1 patient has had complete regression in one area and more than a 50 per cent regression in the other area, 1 had a good initial regression followed by rapid recurrence, 1 did not respond to the therapy and 1 died during treatment. The 9 remaining patients are still under treatment. The tissue most liable to early and serious damage from radioactive phosphorus therapy is bone marrow, but damage should be preventable by frequent blood counts and marrow aspirations and compared during the course of treatment. Serious damage

(marrow aplasia) to the bone marrow of 1 patient has been encountered and in 2 moderate anemia followed the administration of the isotope, but the blood picture improved after treatment was withdrawn.

Hemorrhage from Gastritis.—The evidence for bleeding from gastritis is considered by Benedict from the pathologic, clinical, roentgen and gastroscopic points of view. Before 1933 the diagnosis of gastritis with hemorrhage was rare. Only 4 such cases are listed in the records of the Massachusetts General Hospital. In 3 of the cases the diagnosis was presumptive and in 1 it was suggested by roentgen examination and proved at operation. Since 1933, with the use of the flexible gastroscope, a positive diagnosis of hemorrhage from gastritis has been made in 42 cases. Although a positive roentgen diagnosis was made in only 3, it was suggested in 6 others. The superficial character of the erosions or ulcerations seen by gastroscopy makes them particularly difficult to demonstrate roentgenologically. In addition to the 42 cases there are records of 24 cases of gastritis and hemorrhage in which the question of ulcer was also raised. In the 5 cases with roentgen evidence of a healed duodenal ulcer at the time of the hemorrhage the bleeding evidently was from gastritis alone, as bleeding does not occur from a healed ulcer. In 9, previous or subsequent roentgen examination revealed a duodenal deformity without a crater or a duodenal ulcer. In 10 cases there was a positive roentgen diagnosis of duodenal or gastric ulcer at the time of the bleeding. Since gastroscopic study disclosed gastritis in all these cases it is more than likely that at least some of the hemorrhage was from the gastritis. In addition to the 66 cases of gastritis with hemorrhage, gastroscopy or esophagoscopy has revealed gastritis in the region of the hernia in 4 cases of hiatus hernia with bleeding. Also in 1 case of gastric varices, 1 of scurvy, 1 of chronic thrombocytopenic purpura and 1 of familial hemorrhagic telangiectases, all with hematemesis or melena, chronic gastritis was demonstrated by gastroscopy.

American Journal of Surgery, New York

55:441-624 (March) 1942

Reduced Temperatures in Surgery: III. Experiments on Pelvic and Abdominal Refrigeration, with Especial Reference to Traumatic and Military Surgery. F. M. Allen, New York.—p. 451.

Clinical and Anatomic Investigations of Deep Fascial Space Infections of Hand. J. E. Flynn, Boston.—p. 467.

*Ultraviolet Irradiation of Autotransfused Blood in Treatment of Postabortional Sepsis. E. W. Rebbeck, Pittsburgh.—p. 476.

Mortality of Cholecystectomy in Male. C. A. Bachhuber, Los Angeles.—p. 487.

Abdominal Neuralgia in Relation to Superficial Abdominal Nerves. J. L. Ingham, Easton, Pa.—p. 492.

*Acute Appendicitis in Children. P. D. Allen, New York.—p. 495.

Gastric Resection for Ulcer: Experience in Forty-Four Cases. C. F. Vale, Detroit.—p. 500.

*Continuous Spinal Anesthesia: Report of 100 Cases in Which This Method Was Employed. F. P. Ansbro and L. J. Pico, Brooklyn.—p. 504.

Suprapubic Trocar Drainage of Bladder. G. Austen Jr., Boston.—p. 509.

Proctology in General Office Practice. R. Turell, New York.—p. 516.

Peripheral Vascular Surgery: Lessons from Six Years' Experience. F. M. Al Akl, A. Singer and C. B. Roesch, Brooklyn.—p. 520.

Cephalic Bruit: Review of Literature and Report of Six Cases. M. J. Mackby, Brooklyn.—p. 527.

*Prolonged Stupor Produced by Subdural Hygroma: Relief by Trephine and Drainage. M. Scott, Philadelphia.—p. 534.

Method of Suspending Uterus Without Open Abdominal Incision: Use of Peritoneoscope and Special Needle. J. K. Donaldson, J. H. Sanderlin and W. B. Harrell Jr., Little Rock, Ark.—p. 537.

Diagnosis of Uterine Rupture. A. Sadowsky, Jerusalem, Palestine.—p. 544.

Partial Giant Growth: Operative Reduction in Size of Foot. E. Bergmann, New York.—p. 548.

Use of Transfibular Approach in Arthrodesis of Ankle Joint. T. Horwitz, Philadelphia.—p. 550.

Pathogenesis of Arthritis Following Intravenous Injection of Staphylococci in Adult Rabbit. R. H. Rigdon, Memphis, Tenn.—p. 553.

Postoperative Infection: Its Control by Surgical Technic. J. L. De Courcy, Cincinnati.—p. 562.

Postabortional Sepsis.—From July 1938 through July 1941 Rebbeck used ultraviolet irradiation of autotransfused blood as an adjunct to surgical intervention in the preoperative treatment of 17 and the postoperative treatment of 4 patients with postabortional sepsis. Nine patients admitted instrumentation to produce abortion, 2 admitted taking medication, 8 had apparently spontaneous abortions, 1 patient with psychosis was treated after a therapeutic abortion because of apparent sepsis and 1 used medication and instrumentation. Ten patients were in a state of advanced infection on admission and 11 had early to moderately advanced infection. The pathologic condition ranged from simple, uncomplicated, acute septic endometritis to acute salpingitis, bilateral, "frozen" pelvis, pelvic abscess and septicemia. Following preoperative irradiation of the blood, infection did not spread. The 4 patients treated postoperatively were promptly relieved of toxemia, and their fever decreased. The temperature and toxemia of these 4 patients increased after operation and they were treated postoperatively because of apparent acute endometritis. The other patients had no significant rise of temperature, although their blood was irradiated immediately or up to nineteen days before operation. The results strongly indicate the preventive value of irradiating autotransfused blood. The patients were discharged from four to eight days after curettement.

Acute Appendicitis in Children.—Allen reports a mortality of only 1.7 per cent (five deaths) among 293 children with acute appendicitis. He attributes the reduced mortality rate to earlier hospitalization, the use of fewer cathartics, more preoperative care aimed at correcting fluid balance (especially in the presence of toxic dehydration with spreading peritonitis), better anesthesia and the use of the McBurney incision. This incision is likewise believed to have been the chief factor in reducing hospitalization to fifteen and six-tenths days. Follow-up observation of cases in which drainage was employed and in which only the peritoneum was sutured reveals a decreased incidence of hernia.

Fractional Spinal Anesthesia.—Ansbro and Pico employed the continuous spinal anesthesia developed by Lemmon in one hundred and five surgical interventions ranging from a radical mammectomy taking three hours and requiring 1,020 mg. of procaine hydrochloride to removal of a fibroma taking twelve minutes and requiring 30 mg. of the drug. The author believes that the term "fractional spinal anesthesia" would be more accurate than "continuous." Continuous suggests a long period of time, whereas the method is adaptable to the shortest as well as the longest surgical procedure. It is an unquestioned procedure in other types of anesthesia to give a sufficient amount of the drug to produce the desired depth of anesthesia, and it is logical that the fractional dose should be used in spinal anesthesia. The drop in blood pressure under continuous spinal anesthesia was notably less than with other methods of spinal anesthesia. This is probably due to the small amount of solution injected into the subarachnoid space at any one time. If alarming toxic symptoms should follow the injection of the drug with the fractional technic, 3 to 6 cc. of cerebrospinal fluid can be withdrawn and it has been noticed that the nerves recover promptly from the anesthesia. Headache occurred in only 2 cases. There was no infection of the skin, muscles or meninges, although in 1 case fecal material had collected about the needle and remained there for two hours as the result of the spilling of intestinal contents through a colostomy under the surgical drapes. The incidence of urinary retention was 4 and of pulmonary atelectasis 3 per cent. There was no transient palsy, permanent paralysis or vertebral arthritis. The immediate operative mortality among 15,652 administrations of spinal anesthesia in eighteen American hospitals was forty deaths, or about 1 : 500.

Subdural Hygroma.—In 3 cases of head injury with prolonged periods of unconsciousness, Scott found and drained much clear subdural fluid. In 1 of these the classic type of zanthochromic subdural cyst was found. Consciousness in the 3 cases returned after the drainage. The subdural hygromas produced symptoms identical to those of subdural hematoma. The lesion should be suspected whenever a person with an injury to the head does not tend to recover after the usual proper measures for relief of intracranial pressure and edema have been carried out. The treatment is similar to that used for liquid subdural hematomas. An exploratory trephine or Hudson burr opening is made, the dura is opened, the subdural fluid is evacuated and the space is drained for twenty-four to forty-eight hours with a small cigaret drain. If there is not excess of fluid on the suspected side or relief is not obtained by drainage in three to five days, the opposite side should be inspected.

American Review of Tuberculosis, New York

45:243-356 (March) 1942

*Nontuberculous Pulmonary Infections Complicating Pulmonary Tuberculosis. O. S. Baum and J. B. Amberson Jr., New York.—p. 243.
Tuberculosis in Old Age. A. Rest, Spivak, Colo.—p. 280.
Compulsory Isolation for Tuberculosis: Its Effect on Spread of Tuberculosis in Contacts During One Decade. P. K. Telford and E. Bogen, Olive View, Calif.—p. 288.
*Chemotherapy of Tuberculosis: Sulfanilamide by Intravenous Drip Method. G. Zucker, M. Pinner and H. T. Hyman, New York.—p. 292.
Promin in Experimental Tuberculosis: Sodium P, P'-Diaminodiphenylsulfone-N,N'-Didextrose Sulfonate. W. H. Feldman, H. C. Hinshaw and H. E. Moses, Rochester, Minn.—p. 303.
Survival of Tubefcle Bacilli: Viability of Dried Tubercle Bacilli in Unfiltered Room Light, in Dark and in Refrigerator. C. R. Smith, Los Angeles.—p. 334.
Blood Serum Calcium in Negroes with Tuberculosis. H. D. West and N. C. Jefferson, Nashville, Tenn.—p. 346.
Results of Thoracoplasty. R. Adams, Boston; P. Dufault, Rutland, Mass.; G. F. Skinner, L. Macpherson, Irene Allen, East St. John, N. B., Canada; R. H. Dieffenbach, Newark, N. J.; A. D. Crecca, Verona, N. J.; G. G. Finney, Baltimore; H. Meltzer, Ninette, Man., Canada; A. M. Vineberg, D. Ackman, M. Aronovitch, Montreal, Canada, and A. H. Aufses, New York.—p. 349.

Tuberculosis and Suppuration.—Baum and Amberson encountered pneumonia one hundred and two times in 97 tuberculous patients, fifty-five pulmonary abscesses with suppurative pneumonia in 54 patients who ultimately showed tuberculosis and 32 patients with bronchiectasis and tuberculosis. Pneumonia in the tuberculous population has potentialities of activating the tuberculous lesion. Suppuration within a pneumonic area is the most important factor in the subsequent activation of the lesion. Such suppuration frequently complicates pneumonia caused by the type III pneumococcus and is usually present to some degree in infection caused by the hemolytic streptococcus and other invaders of the interstitial tissue. The bronchorrhea and local hyperemia of pneumonia are factors that also may play an important part in activating a tuberculous lesion. The fibrocalcific lesion and the lesion successfully controlled by collapse therapy are the least likely to be activated by pneumonia. Suppurative pulmonary lesions, such as pulmonary abscess, gangrene and initially suppurative pneumonia, frequently coexist with pulmonary tuberculosis. The course of pulmonary tuberculosis is affected adversely by the complicating nontuberculous suppurative lesion. Tuberculosis may be superimposed on a preexisting suppurative lesion and on bronchiectasis. The activation of tuberculosis by a suppurative disease usually depends on the local destructive process, which disrupts the capsule, if any, and breaks down the tuberculous focus. Tuberculosis, once it develops in bronchiectasis, is likely to progress by being disseminated by copious purulent discharges and hemorrhage, but it may be arrested by collapse therapy. Suppuration in bronchiectasis favors progression of the tuberculosis, particularly if the latter is established in a bronchiectatic lobe.

Chemotherapy of Tuberculosis.—Two patients with minimal, 1 with moderate and 10 with far advanced tuberculosis were given massive doses of sulfanilamide by the intravenous drip method. Several patients had extrapulmonary foci. In judging the results, Zucker and his colleagues evaluated the outcome in each case on the basis of the expected future course of the disease on bed rest alone. A time limit for therapeutic efficacy was set at about two months after completion of treatment. At the end of the five day period of intravenous sulfanilamide most of the patients were given small to moderate doses of sulfanilamide by mouth for from one to five days. Nine of the 13 patients received only one five day course of treatment, 2 received two courses and 2 received three courses. The interval between courses varied from three weeks to three and a half months. Only those patients were retreated who tolerated the therapy well and whose disease indicated that some benefit might be expected. Five of the treated patients showed no clinical change, 3 improved slightly, 4 showed continued progression of the disease and 1 patient with disseminated hematogenous tuberculosis, whose prognosis prior to chemotherapy was considered hopeless, died. The sputum of no 1 patient was permanently or completely converted from positive to negative. The sputum of 1 patient with minimal tuberculosis became negative immediately after the first course of treatment, as did the gastric content on two occasions, but four months later, while the patient was on a semiambulant regimen, the sputum was again positive. No beneficial or adverse effect on the pulmonary tuberculosis was observed that could be attributed to chemotherapy. Effective chemotherapy in pulmonary tuberculosis would probably be most successful in patients in good general health and with early, exudative lesions. If a sufficient amount of a drug was to be given to such a patient and rapid improvement was not obtained, then it could be said that the drug lacked any specific effect. Of the 3 patients who showed some improvement, 2 with minimal pulmonary tuberculosis received two courses of treatment and showed slight resorption over a period of two and a half months and four months, respectively. In neither instance was the improvement better than could be expected on bed rest alone. The third patient after three courses of sulfanilamide had some resorption of infiltrate in both apexes after six months and complete healing of a tuberculous pharyngeal ulcer in three months.

Annals of Internal Medicine, Lancaster, Pa.

16:221-414 (Feb.) 1942

Metabolic Studies in Patients with Cancer of Gastrointestinal Tract: II. Hepatic Dysfunction. J. C. Abels, P. E. Rekers, G. E. Binkley, G. T. Pack and C. P. Rhoads, New York.—p. 221.
*Vitamin D in Treatment of Infectious Arthritis. C. H. Slocumb, Rochester, Minn.—p. 241.
*Mental Symptoms Following Carbon Disulfide Absorption and Intoxication. F. J. Braceland, Chicago.—p. 246.
*Sulfanilamide in Treatment of Erysipelas. L. S. Siegel, L. Rosove and A. G. Bower, Los Angeles.—p. 262.
*Sulfadiazine and Sodium Sulfadiazine: Comparison of Certain of Their Clinical and Pharmacologic Values. C. Wheeler and N. Plummer, New York.—p. 269.
*Advantages and Clinical Uses of Desiccated Plasma Prepared by Adtevac Process. E. E. Muirhead and J. M. Hill, Dallas, Texas.—p. 286.
*Observations on Specific Treatment (Type A Antiserum) of Staphylococcic Septicemia: Second Report. L. A. Julianelle, St. Louis.—p. 303.
William Withering: His Contribution to Medicine. J. C. Meakins, Montreal, Canada.—p. 327.

Vitamin D in Treatment of Infectious Arthritis.—Slocumb states that large doses of vitamin D have partially controlled the symptoms of infectious rheumatoid or atrophic arthritis in 7 of 14 cases in which twenty-five courses of treatment (daily dose from 52,500 to 386,000 units for twelve days to fifteen and a half months) were administered. If there was no immediate clinical improvement the administration of the vitamin was continued for at least one and a half months. There was little objective effect. The beneficial effects were only transitory, as the symptoms usually recurred after treatment was discontinued. There was some risk of renal damage. However, the occurrence of toxic symptoms or renal damage was not necessary for clinical improvement to ensue. There was no definite correlation between the clinical improvement and toxic symptoms or renal damage and retention of urea. Gastrointestinal upset was the most frequent warning sign of toxicity, though in 1 case the urea became elevated without any gastrointestinal upset.

Carbon Disulfide Absorption and Intoxication.—Braceland discusses the mental symptoms of carbon disulfide psychosis occurring in 8 of 120 workers in a viscose rayon plant and in 9 similar cases discovered in mental hospitals. The psychosis was characterized by confusion, combativeness, hallucinations, delusions, depression and, finally, amnesia for the acute attack. While the onset of the psychosis is usually acute, attentive observers have noticed a gradual personality change accompanied by a phase of irritability, depression, headache and insomnia. The libido is lessened, and dreams of a terrifying nature occur. The symptoms are not dependent on physical habitus or heavy exposure but to individual susceptibility to carbon disulfide. Once an individual has shown toxic symptoms, he should be removed from further exposure. A diet rich in vitamins should be procurable in the cafeterias of plants and the homes of workers employed by the carbon disulfide industry. Recovery takes from two to six months or more.

Sulfanilamide for Erysipelas.—From April 1937 to August 1939 Siegel and his co-workers state that the 303 patients with erysipelas who entered the Los Angeles County Hospital were treated with sulfanilamide. The average number of days of illness before admission was two and six-tenths. The precipitating factor in 37 per cent was trauma, furunculosis and ulceration. The ages of the patients ranged from less than 1 year to 65 years. On admission, 153 patients had one or more

associated diseases. The dose of sulfanilamide for patients up to 5 years of age was 0.065 Gm. per pound of body weight for twenty-four hours. Half of the total dose was given at once and the other half was given in divided doses every four hours over the remaining twenty-four hours. After twenty-four hours the initial dose was reduced by one third and on the third day to one half. This maintenance dose was given for three to five days after clinical cure ensued to prevent relapse. Older children and adults were given similar treatment except that the dose was calculated at 1 Gm. for 20 pounds (9 Kg.) of body weight for twenty-four hours. The average sulfanilamide level in the blood of 121 patients determined forty-eight or more hours after admission was 5.8 mg. per hundred cubic centimeters. The general average period of hospitalization was eight days, the general average time required for the temperature to reach normal was forty-eight hours and the general average time required for the lesion to regress was fifty hours. The lesion did not spread after treatment was instituted, and there was only one recurrence. Eight patients had complicating abscesses, 1 pneumonia with hemolytic staphylococcus septicemia and pulmonary abscess and 1 nephritis with uremia. The mortality rate for the hospital from 1929 to 1933 was 32.9 per cent for infants less than 1 year of age, and the average mortality rate was 8.1 per cent. There were four deaths among the 303 patients treated with sulfanilamide, or a gross mortality rate of 1.3 per cent. Two and possibly three of the four deaths were due to the drug; however, the consistently reduced morbidity and mortality from erysipelas that use of the drug brings about by far exceeds the dangers.

Sulfadiazine and Sodium Sulfadiazine.—Wheeler and Plummer determined the absorption, excretion and acetylation of sulfadiazine orally and of sodium sulfadiazine orally and intravenously in 218 cases in which the drugs were administered over long periods of time. Sulfadiazine given orally yielded higher concentrations but smaller proportions of acetylated drug in the blood and in the urine than did any of the other sulfonamide drugs. Sodium sulfadiazine after oral administration yielded even higher concentrations of drug in the blood than did sulfadiazine and, like the latter, it acetylated to only a slight degree in the blood and in the urine. Initial doses of 4 Gm. of sulfadiazine and of sodium sulfadiazine were much more effective than initial doses of 2 Gm. in establishing a high concentration of the drug in the blood soon after treatment was begun. Sodium sulfadiazine given intravenously yielded a high level of the drug in the blood, it acetylated to only a slight degree and it appeared to be relatively nontoxic. Toxic reactions after sulfadiazine were less frequent and less serious than after any of the other sulfonamide drugs. Pharmacologically, this suggests that sulfadiazine and sodium sulfadiazine possess definite advantages over the other generally used sulfonamide drugs.

Advantages and Uses of Desiccated Plasma.—Muirhead and Hill emphasize the importance of producing a large volume of desiccated plasma and report the experience they have gained from its clinical use in 276 cases in a routine hospital service during twenty-one months. A total of six hundred and seventy-four doses of four times concentrated plasma ranging from 50 to 7,690 cc. per dose have been given. Only five febrile reactions, all of the pyrogenic type, were encountered. The disorders for which the plasma was given were shock, shock prevention, burns, protein feeding, edemas, head injuries, toxemias of pregnancy and other conditions. Distinctions between plasma and serum as a therapeutic agent can be disregarded, as the proper preparation of either gives an innocuous product. Adtevac or desiccated plasma is literally neither plasma nor serum. The use of Filter cel during Seitz filtration removes most of the fibrinogen fraction, leaving a plasma that approaches serum in composition. The main emphasis in the treatment of shock is to restore the circulating blood volume; prevention of exposure, warm surroundings and the giving of oxygen are of additional value. In military medicine one of the greatest problems is shock, and in this regard a therapeutic agent of high efficiency having ideal storage properties is essential. Properly desiccated plasma appears to be such an agent. For mass production bulk desiccation, first mentioned by Elser, is safe and can be easily performed.

Specific Treatment of Staphylococcic Septicemia.—Julianelle has given specific antibacterial serum (obtained from rabbits following immunization with intact organisms treated with solution of formaldehyde, particularly prepared to contain high titers of antibody capable of reacting with the somatic carbohydrate extractable from pathogenic [type A] staphylococci) to 98 unselected patients with genuine staphylococcic septicemia and 4 with severe infection and unverified septicemia. All the patients received whatever supplementary treatment was indicated. Osteomyelitis was the most frequent forerunner of septicemia and responded best to serum, with a survival of 24 out of 27 patients. Fifteen patients had endocarditis; it was refractory to type A serum, and the fatality rate was 100 per cent. Of 14 patients with furunculosis and varying metastatic infection, 7 survived and 7 died. Of 8 patients with septicemia secondary to primary pneumonia, 4 died and 4 survived. In comparison, of 22 patients with pneumonia secondary to a primary surface lesion 12 died and 10 survived. Four patients with cellulitis with metastasis and 4 with septicemia terminal to some other condition died. The 3 patients with pericarditis and the 3 with sinus thrombosis with secondary meningitis died, whereas 3 with primary meningitis and 2 with endometritis following abortion survived. Of the remaining 19 patients with a variety of conditions, 8 recovered and 11 died. Staphylococcic septicemia in diabetes was encountered on five occasions. Although these 5 patients died there were other factors involved, so that the combination of diseases need not necessarily imply a fatal termination. Of the 54 patients who died, 15 did so within seventy-two hours after serotherapy was begun. The usual survival rate has been doubled, but the actual evaluation of the efficacy of the serum must await future work from different sources.

Archives of Otolaryngology, Chicago

35:355-512 (March) 1942

Physiology of Vocal Cords in Phonation and Respiration. J. J. Pressman, Los Angeles.—p. 355.
*Local Use of Sulfathiazole in Management of Simple Mastoidectomy Wounds. D. Guerry 3d and F. J. Putney, New York.—p. 399.
Importance of Control of Pulmonary Lesion When Tuberculous Tracheobronchitis Coexists. B. J. Elwood, B. P. Potter, A. G. Sacco and J. J. Pagliughi, Jersey City, N. J.—p. 408.
Increased Sensitivity to Bone Conducted Sounds. A. G. Pohlman, Los Angeles.—p. 418.
Functional Examination of Hearing. A. Lewy and N. Leshin, Chicago.—p. 437.
Anatomy and Physiology of Ear. J. R. Richardson and E. M. Holmes, Boston.—p. 480.

Mastoidectomy Wounds.—Guerry and Putney used sulfathiazole locally in the simple mastoidectomy wounds of 20 unselected patients, while in 20 others, serving as controls, the sulfathiazole was omitted. The drainage period of the patients whose wounds were treated locally averaged sixteen and seven-tenths days, or 52.8 per cent less than that of the control series, and the postoperative period of hospitalization was reduced to an average of eleven and four-tenths days, or 55 per cent. The use of sulfathiazole also enhanced healing and reduced suppuration to a minimum.

Archives of Pathology, Chicago

33:295-410 (March) 1942

Observations on Dry Films of Cultures of Lymphoid Tissue. L. Berman, Detroit.—p. 295.
Changes in Osseous Tissues of Young Dogs After Prolonged Administration of Estradiol Benzoate. C. J. Sutro and L. Pomerantz, New York.—p. 305.
Reaction of Bone to Metastasis from Carcinoma of Breast and Prostate. W. S. Sharpe and J. R. McDonald, Rochester, Minn.—p. 312.
Evolution of Experimental Radiation Ulcers of Intestine. N. B. Friedman and S. Warren, Boston.—p. 326.
*Factors Influencing Development and Time of Appearance of Mammary Cancer in Rat in Response to Estrogen. C. F. Geschickter and Elizabeth W. Byrnes, Baltimore.—p. 334.
Histamine Theory of Anaphylactic Shock, with Special Reference to Anaphylaxis in Rabbit. M. Rocha e Silva, São Paulo, Brazil.—p. 387.

Mammary Cancer in Rat.—According to Geschickter and Byrnes, a mammary cancer developed in 202 of 555 albino rats treated with estrogens. The animals were inbred for seven years, during which time spontaneous mammary cancer did not develop in a colony of more than 5,000 animals. The percentage of rats in which estrogenic mammary cancer develops varies, but the disease might possibly develop in all of them if they

were allowed to survive the required time, but only a few animals with macroscopic growths were allowed to survive. Only 2 such animals showed multiple metastases to the lungs and lymph nodes. To produce mammary cancer, the dose of estrogen must be well beyond the physiologic limit (ten or more times the threshold dose) and the treatment continuously applied for months. The production of mammary cancer is not influenced by the amount of the daily dose but by the duration of estrogenic activity and the method of administration. It is difficult to demonstrate that sex, age or castration influences susceptibility to estrogenic mammary cancer. Important species differences were evident in the experiments carried out in monkeys, rabbits and rats. The administration of testosterone or progesterone together with or following estrogenic stimulation does not prevent mammary cancer from appearing. However, the growth of estrogenic cancer is inhibited by anterior pituitary extract. Various changes in the endocrine glands make their appearance with mammary cancer, and a cancerous change has been observed in other organs. Experiments on rats with atrophic and fibrotic mammary tissue suggest that mammary cancer in women may result from one or a combination of the following factors: (1) abnormally intense estrogenic stimulation during the mammary development of adolescence or during a previous pregnancy, (2) prolonged ovarian dysfunction during the menopause resulting in relative hyperestrogenism and having the characteristics of adenosis or Schimmelbusch's disease and (3) intense or continuous estrogenic stimulation during the menopause superimposed on the two foregoing factors.

California and Western Medicine, San Francisco

56:55-110 (Feb.) 1942

So-Called Fungous Infections of Hand. S. Ayres Jr. and N. P. Anderson, Los Angeles.—p. 63.
Hypertension and Surgical Kidney. T. E. Gibson, San Francisco.—p. 66.
Tuberculin Patch Test: Its Reliability; Comparison with Mantoux Test. P. Cohen, Santa Barbara.—p. 70.
Pernicious Anemia: Adequate versus Optimal Treatment. J. M. Askey, Los Angeles.—p. 72.

Canadian Public Health Journal, Toronto

33:51-98 (Feb.) 1942

Britain's Health in Wartime. W. Jameson, Toronto.—p. 51.
Development of Municipal Health Department and Provision of Health Districts in City of Montreal. A. Groulx, Montreal.—p. 60.
*Studies on Influenza: Antibody Level: Isolation of Virus. R. Hare, W. J. Auger and Laurella McClelland, Toronto.—p. 72.
Health Teaching in Primary School. J. Gilbert, Granby, Que.—p. 79.
Fourth Outbreak of Staphylococcic Food Poisoning in Hamilton, Canada (May 1941). J. E. Davey, W. J. Deadman and F. J. Elliott, Hamilton, Ont.—p. 82.
Special Report on Food Poisoning Outbreak in Hamilton, Canada, May 1941. R. J. Wilson, Toronto.—p. 86.

Antibody Level and Susceptibility to Influenza.—In an effort to determine whether there is a distinct correlation between a person's antibody level and his susceptibility to influenza A, Hare and his colleagues carried out studies along these lines among an urban population. The subjects were asked to gargle 10 cc. of isotonic solution of sodium chloride and eject it into a screw capped bottle for transport to the laboratory. Inoculation of ferrets was carried out as described by Hare and Yen, and neutralization tests were carried out by the method described by Francis, Rickard and Beck. The immunity of the subject to influenza was ascertained by titration of the neutralizing antibody or the complement fixing antibody. The results suggest that there may be a correlation between the antibody level and the person's susceptibility to the disease. The investigation suggests that a high proportion of the normal population is susceptible to influenza A, for about 90 per cent have an antibody level which is at or below the highest level that is found before infection in persons who become infected. Attempts to raise this generally low level with the complex vaccine of Horsfall, Lennette and Rickard have not always proved successful nor does the immunity produced by one dose of the vaccine persist. A stronger vaccine, and possibly more than one dose, is therefore required to raise the titer in as many persons as possible with initially low titers. The most serious objection to mass immunization with vaccines of known influenza virus is the fact that many influenzas, even during an epidemic, are due to agents as yet not identified. Therefore the isolation and identification of these other agents is a prime necessity before mass immunization is seriously contemplated.

Connecticut State Medical Journal, Hartford

6:155-238 (March) 1942

Effect of Recent Developments in Nutrition on Rationing of Army. P. E. Howe, Washington, D. C.—p. 157.
*Treatment and Nationwide Control of Gonococcic Infections. O. F. Cox, Boston.—p. 161.
*Treatment of Influenzal Meningitis. Hattie E. Alexander, New York.—p. 167.
Carcinoma of Uterine Fundus. A. F. Resnisky, Hartford.—p. 173.
Cancer of Lip. R. E. Dunne, Hartford.—p. 175.
Accessory Diagnostic Procedures. E. J. Whalen, Hartford.—p. 177.
Diagnosis and Treatment of Hysterical Paralyses by Intravenous Administration of Pentothal Sodium: Case Reports. M. L. Garofalo, New Haven.—p. 180.
Medical Licensure in Connecticut. C. J. Bartlett, New Haven.—p. 182.

Gonococcic Infection.—Cox analyzed 500 consecutive men with gonorrhea admitted to the Boston Dispensary and treated with sulfathiazole. At the end of the second week following the beginning of treatment 453 patients were still under observation, of whom 296 (65 per cent) reached a cure status within two weeks. Exaggerated propaganda of this two week cure rate is not needed to convince the public that great advances have been made in the treatment of gonorrhea. The numbers cured in subsequent weeks (up to sixteen weeks) raised the total to 416. However, as an attempt is made to get a minimum of ten negative smears and cultures at weekly intervals before a patient is discharged as cured, only 234 of the 416 patients can be classified as cured. Some of the 36 men thought cured on the evidence of one or two negative cultures may have had a subsequent clinical relapse or positive culture, and also some of the 47 closed out before the end of the second week may have been actually cured. There is apparently no doubt that the 65 per cent two week cure rate can be attributed to sulfathiazole. The other patients may have been benefited by chemotherapy, but there is little justification for claiming a sulfonamide cure in a patient who did not reach such a status for six or more weeks after chemotherapy was begun. Sulfathiazole is the drug of choice at the moment, it is highly efficient and it is almost entirely free of toxic reactions. Because of the threat of war, an increase in genital infection is probable. Continued effort must be made to educate the public as to the dangers of infection, how the infection may be prevented and what to do if infection is suspected. Under no circumstances should the impression be allowed to prevail that gonorrhea is no longer a serious disease.

Treatment of Influenzal Meningitis.—Alexander presents the data on 45 patients with influenzal meningitis who were given rabbit antiserum intrathecally and intravenously in conjunction with chemotherapy. The recovery rate was 74 per cent, or 33 patients. There is reason to believe that the amount of free specific polysaccharide in the blood and the spinal fluid is an index to the severity of the infection and together with the quantity of the same substance within the capsule of the organisms determines the amount of antibody necessary. Direct measurement is impossible. Only gross evaluation is possible on the basis of objective laboratory evidence. Increasing experience suggests that limiting the administration of serum by the intravenous route constitutes the method of choice. Rabbit antibody passes readily from the blood to the meninges (detected in the spinal fluid by the presence of agglutinins). While the evaluation of the size of the initial dose necessary for the total antibody needs of a given patient is in the experimental stage, certain criteria are of value. In mild cases of early meningitis in which examination of spinal fluid smears fails to reveal organisms but culture yields a growth in twelve to twenty-four hours, 50 mg. seems to be sufficient. If the meningitis is moderately severe, if chemotherapy had been given for four to five days prior to the patient's admission to the hospital, if the spinal fluid sugar is only slightly decreased and if organisms are difficult to find, approximately 75 mg. seems adequate. If the meningitis is severe and no previous therapy had been given the patient, or if he has had chemotherapy for three to four weeks and the spinal fluid shows infection but the sugar is almost normal, a minimum of 100 mg. seems indicated. The

serum should be given intravenously for forty-eight hours and if at the end of this time the spinal fluid has not improved significantly and organisms are still demonstrable on smear, serum should then be administered intrathecally. Data on the 12 patients who died reveal that 3 were inadequately treated according to present criteria, 1 after apparent complete recovery for sixteen days continued to have leukopenia after the drug was discontinued and had a fulminating recurrence which failed to respond to therapy; 1 was improving and the spinal fluid became sterile for three days when leukopenia intervened, following which the course was rapidly downhill. Of the remaining 7 patients in whom leukopenia developed, 6 fall into the young infant group. The greatest problem is to improve the results in infants aged less than 7 months. It is chiefly a question of recognizing clinical evidence of meningeal involvement at an earlier stage, and for this the clinician must be depended on.

Indiana State Medical Assn. Journal, Indianapolis

35:123-186 (March) 1942

Selective Service and the Medical Profession. L. B. Hershey, Washington, D. C.—p. 123.
Functions of Procurement and Assignment Service. S. F. Seeley, Washington, D. C.—p. 126.
Arteriosclerotic Heart Disease. A. N. Ferguson, Fort Wayne.—p. 129.
Social Security Medical Problems. C. H. Phifer, Chicago.—p. 139.
Rational Use of Physical Medicine. C. F. Voyles, Indianapolis.—p. 148.

Journal Industrial Hygiene & Toxicology, Baltimore

24:43-58 (March) 1942

Absorption, Accumulation and Excretion of Ingested Silica. J. L. Webb, R. M. Selle and C. H. Thienes, Los Angeles.—p. 43.
Response of Guinea Pigs and Rats to Repeated Inhalation of Vapors of Mesityl Oxide and Isophorone. H. F. Smyth Jr., Jane Seaton and Louise Fischer, Pittsburgh.—p. 46.
Observations on Preparation of Slides for Particle Size Determination. L. Silverman and W. Franklin, Boston.—p. 51.
Arrested Tuberculosis and Hospital Employment. L. Brahdy, New York.—p. 53.

Journal of Neurophysiology, Springfield, Ill.

5:89-166 (March) 1942

Effects Evoked in Axon by Activity of Contiguous One. A. Arvanitaki, Tamaris, France.—p. 89.
Localization of Enzymes in Nerves: I. Succinic Dehydrogenase and Vitamin B_1. D. Nachmansohn and H. B. Steinbach.—p. 109.
Cerebellar Action Potentials in Response to Stimulation of Cerebral Cortex in Monkeys and Cats. R. S. Dow, Portland, Ore.—p. 121.
Effects of Polarization on Nerve Action Potentials. Helen Tredway Graham, St. Louis.—p. 137.
Stimulation of Peripheral Nerve Terminations by Active Muscle. D. P. C. Lloyd, New York.—p. 153.

Maine Medical Association Journal, Portland

33:21-42 (Feb.) 1942

Critical Survey of Treatment of Burns. R. H. Aldrich, Boston.—p. 21.
Looking Back Fifty Years. W. E. Sincock, Caribou.—p. 31.

33:43-64 (March) 1942

Toxemias of Pregnancy. C. W. Sewall, Boston.—p. 43.
Acute Intestinal Obstruction: Some Important Points in Its Diagnosis and Treatment. H. Brinkman, Wilton.—p. 51.

Missouri State Medical Assn. Journal, St. Louis

39:65-94 (March) 1942

Etiology of Hypertension. F. C. Helwig, Kansas City.—p. 65.
Arterial Hypertension: Definition of Normal Blood Pressure Classification of Arterial Hypertension. J. V. Bell, Kansas City.—p. 67.
Treatment of Hypertension. M. G. Berry, Kansas City.—p. 68.
Management of Hypertensive Heart Failure. C. R. Ferris, Kansas City.—p. 70.
*Tumor Cells in Body Fluids: Evaluation of Diagnosis. E. B. Helwig, St. Louis.—p. 73.
Barnard Free Skin and Cancer Hospital Research Report for 1941. E. W. Cowdry, St. Louis.—p. 76.
Opportunity Presented to Barnard Free Skin and Cancer Hospital Today. M. G. Seelig, St. Louis.—p. 80.
Report of Executive Committee of Barnard Free Skin and Cancer Hospital. F. J. Taussig, St. Louis.—p. 82.
A Two Year Old Child Swallows a Mill. J. S. Knight, Kansas City.—p. 83.

Tumor Cells in Body Fluids.—Helwig searched for tumor cells in sixty-five peritoneal or pleural fluids obtained from 56 patients. Paraffin sections of the fluids were stained with hematoxylin and eosin. In most instances several consecutive sections were made and examined on a morphologic basis without knowledge of the patient's history or of the cavity from which the fluid was obtained. Of eighteen fluids reported as positive, fifteen were proved or presumed correct by biopsy, by examining the cavity at operation or at necropsy, by roentgen study or by palpation of a mass in the cavity, one was proved incorrect and the exact nature of two was not established. Of forty-seven fluids reported as negative the diagnosis of fifteen was proved correct, of fifteen it was presumed to be correct, of three it was proved incorrect, of eleven it was presumed incorrect and of four it was not established. In 2 of the 3 cases in which the diagnosis of the fluid was "negative for tumor cells" but neoplastic disease was present, ascites was associated with the neoplasm but in neither instance was it a manifestation of metastasis to the peritoneum. Obviously the ascitic fluid could not show tumor cells when the neoplasm did not involve the peritoneum and therefore the diagnosis was actually correct for the specimen examined. In the other case the ascitic fluid failed to show identifiable tumor cells, although a neoplasm involving the peritoneum was present at necropsy. The eleven fluids, from patients with clinical evidence of a neoplasm but whose body cavities were not examined, that were "negative for tumor cells" might have been influenced by some mechanism other than the direct peritoneal involvement by the tumor. Thus in any analysis conducted to judge the accuracy of the test it is necessary not only to know whether a neoplasm was present in the patient but also whether the serous surface of the particular cavity from which the fluid is withdrawn is involved. Even though a patient has a neoplasm, tumor cells cannot possibly be identified in fluid obtained from an uninvolved cavity. Fragments of tissue composed of stroma and acini or papillae, atypical mitotic figures and bizarre multinuclear cells are indicative of malignant cells. Desquamated cells from the lining of the serous cavities may be confused with tumor cells. Cells arranged in clumps or acini should be accepted as tumor cells only when they exhibit pronounced pleomorphism. Both positive and negative fluid may contain cells in mitotic division, cells with vacuoles, erythrocytes and fibrin.

New England Journal of Medicine, Boston

226:367-410 (March 5) 1942

Evaluation of Regional Lymph Node Dissection in Treatment of Carcinoma. G. W. Taylor, Boston.—p. 367.
*Use of Stilbestrol in Relief of Essential Dysmenorrhea. S. H. Sturgis, Boston.—p. 371.
Pyruvic Acid Studies in Peripheral Neuropathy of Alcohol Addicts. H. Wortis, E. Bueding and N. Jolliffe, New York.—p. 376.
Regional Anesthesia: Its Use in Obstetrics and Gynecology. E. G. Waters, Jersey City, N. J.—p. 380.
Hematology: Diseases Other Than Anemia. W. Dameshek, Boston.—p. 383.

Diethylstilbestrol for Essential Dysmenorrhea.—Nineteen consecutive patients complaining of dysmenorrhea every month but having no organic disease of the pelvis were given "control" injections of estradiol benzoate and one or more courses of 1 or 2 mg. of diethylstilbestrol daily by mouth for various periods. Sturgis considered the result of the diethylstilbestrol courses satisfactory only when the patients were free from any cramps in the month that treatment was given. In each instance the control injections satisfactorily eliminated pain during the next flow. The 19 patients received seventy-nine courses of oral treatment, and cramps were satisfactorily eliminated fifty-nine times. In the twenty failures pain was present during the flow immediately following treatment. The twenty failures occurred in 11 cases. In seventeen of these twenty courses treatment was started too late in the cycle to prevent ovulation, as the menses in each instance occurred less than three weeks after treatment was begun. One of the three other failing courses was started twenty-two days before the next period, emphasizing the difficulty of attempting to establish an arbitrary time limit for a given medication to produce a biologic effect. The other two courses were started thirty-three and thirty-four days, respectively, before the next periods occurred; it is believed that in these cases ovulation was delayed but not prevented by the medication. Diethylstilbestrol primarily inhibits the follicle stimulating hormone fraction of the pituitary gland and secondarily suppresses the growth of ovarian follicles and hence ovulation during the time that treatment is given. After a course of treatment is concluded the normal pituitary ovarian cycle is reestablished, and invariably dysmenorrhea

recurs in about one month if therapy is not resumed. In about 20 per cent of the cases treatment must be discontinued because of gastrointestinal complaints; therefore the therapy is of value for temporary, rather than for permanent, relief.

New Orleans Medical and Surgical Journal

94:411-460 (March) 1942

Health for Victory. F. J. Underwood, Jackson, Miss.—p. 411.
Coronary Occlusion in Private Practice. M. W. Hunter, Monroe, La. —p. 414.
Tachycardias: Diagnosis and Treatment. G. R. Herrmann and G. M. Decherd, Galveston, Texas.—p. 417.
Value and Limitations of Electrocardiography. W. R. Wirth, New Orleans.—p. 423.
Sympathetic Nerve Blocks in Rehabilitation of Injured Extremity: Report of Cases and Discussion of Causalgia. H. Mahorner, New Orleans.—p. 426.
Pitfalls in Early Diagnosis of Leprosy. G. H. Faget, Carville, La. —p. 432.
Allergic Respiratory Disease and Pneumonia in Childhood. S. Cohen, New Orleans.—p. 440.
Venereal Diseases Among Selectees and Volunteers in Louisiana. J. H. Musser and R. H. Onstott, New Orleans.—p. 442.

Public Health Reports, Washington, D. C.

57:285-324 (Feb. 27) 1942

Appraisal Technic for Urban Problem Areas as Basis for Housing Policy of Local Governments: Illustrative Results from Three Test Surveys. Report of the Subcommittee on Appraisal of Residential Areas, Committee on Hygiene of Housing, American Public Health Association.—p. 285.
Pathologic Histology in Guinea Pigs Following Intraperitoneal Inoculation with Virus of Q Fever. R. D. Lillie.—p. 296.

57:325-368 (March 6) 1942

State Diphtheria Immunization Requirements: Comparative Analysis of Statutes and Health Department Regulations. W. Fowler.—p. 325.

Southern Medical Journal, Birmingham, Ala.

35:225-324 (March) 1942

Ventricular Strain: Changes in Electrocardiogram Produced by Acute and Chronic Compression of Pulmonary Artery. H. M. Winans, J. V. Goode and C. T. Ashworth, Dallas, Texas.—p. 225.
*Certain Constitutional Manifestations of Thyrotoxicosis. H. J. Morgan, Nashville, Tenn.—p. 232.
*Staphylococcic Pneumonia During Epidemic Influenza in North Carolina (1941). R. D. Baker, Durham, N. C.—p. 240.
Present Status of Operative Treatment for Hydrocephalus. A. D'Errico, Dallas, Texas.—p. 247.
Congenital Choanal Occlusion. W. L. Bonham, Oklahoma City.—p. 252.
Transplants to Thumb to Restore Function of Opposition: End Results. C. E. Irwin, Warm Springs, Ga.—p. 257.
Surgical Management of Colonic Cancer. C. Rosser, Dallas, Texas.—p. 262.
Some Pitfalls in Proctologic Diagnosis. L. J. Hirschman, Detroit.—p. 269.
Clinical Conclusions on High Spinal Anesthesia. E. G. Wolff and H. B. Stewart, Tulsa, Okla.—p. 274.
Evaluation of Audiometer in Testing Hearing. C. C. Swann, Asheville, N. C.—p. 280.
Subluxation of Head of Radius: Pediatric Conditon. S. A. Anderson Jr., Richmond, Va.—p. 286.
Prophylactic Use of Vitamin K in Obstetrics. L. M. Hellman and L. B. Shettles, Baltimore.—p. 289.
Care of Prematures in the Small Hospital. J. L. Blanton, Fairmont, W. Va.—p. 293.
Treatment of Vincent's Infection with Fuadin. D. C. Smith, Charlottesville, Va.—p. 299.
Sulfanilylguanidine in Treatment of Enteric Infections. J. G. Eblen, Knoxville, Tenn.—p. 302.
Unclassified Type of Ulcerative Disease of Colon. P. W. Brown, L. A. Buie and H. M. Weber, Rochester, Minn.—p. 305.
Scope of Pharmacology. H. B. Haag, Richmond, Va.—p. 312.

Manifestations of Thyrotoxicosis.—Morgan discusses the constitutional disorders, osteoporosis, myopathy, exophthalmopathy and avitaminosis, that are intimately associated with hyperactivity of the thyroid and which may be so conspicuous as to alter the usual pattern of thyrotoxicosis and lead to mistakes in diagnosis and treatment. Illustrative cases of each disorder are presented, and the conclusion is reached that the concept, expressed by Means in 1941, that thyrotoxicosis is a constitutional disturbance involving a complicated hormonic imbalance having widespread effects in which the thyroid is but one item is both sound and useful.

Staphylococcic Pneumonia.—Baker states that in the course of the relatively mild epidemic of influenza that reached North Carolina in January 1941 several cases of pneumonia developed, some of which led to rapid death. The pneumonia presented unusual appearances at necropsy, was regularly associated with the hemolytic Staphylococcus aureus in cultures from the lungs and was reminiscent of pneumonia of the great influenza pandemic of the first world war. The 4 cases studied at necropsy at Durham were characterized by ulcerative and diphtheritic tracheobronchitis and massive fulminating, edematous and hemorrhagic pneumonia. In addition to hemolytic Staph. aureus being cultivated from the lungs, it could be demonstrated in the sections of the larger air passages and lungs in luxuriant growth. Necrotizing foci were present in the early cases and clusters of abscesses in the older ones. Staphylococcic pneumonia with this distinctive morphologic appearance in the larger air passages and lungs scarcely occurs except in association with epidemic influenza. It seems highly probable that the pathologic changes observed represent the combined effect of virus and bacterium. Evidence in the literature suggests that influenzal virus in itself is capable of producing pneumonia in man and experimental animals (ferrets and mice). In most cases of epidemic influenzal pneumonia the concept of a synergistic action between virus and bacteria appears to fit the various observations.

Southwestern Medicine, El Paso, Texas

26:33-66 (Feb.) 1942

Surgical Considerations in Jaundice. K. A. Meyer, Chicago.—p. 35.
Senile Heart: Observations on Prognosis and Management. L. F. Bishop Jr., New York.—p. 38.
Osteopathia Condensans Disseminata: Two Case Reports. D. S. Kellogg and J. F. Linsman, El Paso, Texas.—p. 44.
Effect of Electromagnetic Radiations on Flocculation Tests for Syphilis. E. L. Breazeale, Tucson, Ariz.—p. 47.
*Thrombocytopenic Purpura Following Administration of Sulfathiazole: Case Report. W. I. Werner, Albuquerque, N. M.—p. 49.

Thrombocytopenic Purpura Following Administration of Sulfathiazole.—Werner reports a case of thrombocytopenic purpura which was due to idiosyncrasy to sulfathiazole. The patient was given 13.9 Gm. of sulfathiazole over a period of five days, at which time a slight rash developed. Twenty days later he was given 1 Gm. of the drug, and purpuric symptoms developed within twelve hours. A thrombocytopenia existed, as no platelets were present. Sulfathiazole is not a harmless drug. Daily studies of the blood are important, as special changes may suggest an impending blood dyscrasia.

Texas State Journal of Medicine, Fort Worth

37:703-760 (March) 1942

Angina Pectoris: Etiology and Treatment. W. J. Kerr, San Francisco.—p. 711.
Amebiasis Cutis. R. J. Jermstad, Fort Worth, and G. V. Launey, Grand Prairie.—p. 713.
Bone Changes in Some of Nutritional and Metabolic Disorders in Children. J. B. Johnson and H. M. Anspach, Galveston.—p. 715.
Banti's Syndrome. T. P. Churchill, Amarillo.—p. 720.
Childhood Tuberculosis. J. P. Gibson, Abilene.—p. 723.
Reactions to Arsenic Therapy. A. C. King, San Antonio.—p. 726.
Indications for Partial Gastrectomy. W. E. Crump, Wichita Falls. —p. 729.
Safeguards in Cataract Surgery. F. H. Newton, Dallas.—p. 735.
Influence of Racial Factors on Infant Mortality in Texas. A. M. Dashiell, Austin.—p. 738.
Hyperthyroidism in Childhood. A. W. Pierce, Wichita Falls.—p. 740.
Use of Contrast Mediums in Urology. S. Cooper, Abilene.—p. 744.

Virginia Medical Monthly, Richmond

69:117-174 (March) 1942

Can Mental Hygiene Prevent Neurosis? M. Moore, Boston.—p. 118.
Gastric Cancer. G. W. Horsley, Richmond.—p. 126.
Surgical Indications for Use of Blood Plasma. C. S. White and J. L. Collins, Washington, D. C.—p. 134.
The Physician's Responsibility in Local and National Defense. E. T. Trice, Richmond.—p. 137.
Rorschach Ink Blot Method. J. B. Funkhouser, Marion, and D. M. Kelley, San Francisco.—p. 139.
Sinuses. C. T. St. Clair Sr., Bluefield, W. Va.—p. 144.
Selective Service as Applied to City of Norfolk. C. L. Harrell, Norfolk. —p. 146.
Unilateral Twin Ectopic Pregnancy. J. M. Habel Jr., Suffolk.—p. 150.
Dacryolithiasis with Stricture of Lacrimal Ducts: Case Report. N. H. Turner, Richmond.—p. 151.
Perforated Diverticulitis of Sigmoid with Two Case Reports. C. F. James Jr., Fort Monroe.—p. 152.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

26:93-140 (March) 1942

Operation for Cataract: Closure of Wound; Frequency of Complications with Different Methods of Extraction. M. Klein.—p. 93.
Investigation Concerning Lens Capsule: Its Importance in Technic of Intracapsular Cataract Extraction. M. Klein.—p. 118.
Conjunctival Implantation Cyst Following Operation for Detachment of Retina: Case. J. R. Ascott.—p. 126.
Diagnostic Significance of Retrobulbar Neuritis. Rosa Ford.—p. 128.

Indian Medical Gazette, Calcutta

76:705-768 (Dec.) 1941

Endemic Typhus in Mysore. R. Heilig and V. R. Naidu.—p. 705.
Trichostrongylus Infection in Man. P. A. Maplestone.—p. 710.
*Sulfaguanidine in Cholera. R. N. Chopra, A. J. H. de Monte, S. K. Gupta and B. C. Chatterji.—p. 712.
Method for Ascertaining Overlapping of Pubis by Head by Means of Abdominal Examination Alone. N. A. Purandare and B. N. Purandare.—p. 714.
Dystocias Due to Anomalies of Fetus Associated with Dilatation of Fetal Urinary Bladder. Grace Edwards Barar.—p. 715.
Developmental Anomalies of Kidney and Ureter. H. E. Murray and H. Ahmed.—p. 718.
Arsenic in Food. R. B. K. N. Bagchi and H. D. Ganguly.—p. 720.
Detection of Arsenic in Burned Human Bones and Ashes. S. N. Chakravarti, M. Z. Faruqi and K. R. Ganguly.—p. 722.
Combined Digitalis and Rauwolfia Poisoning in Human Subject. M. N. De and T. Chatterjee.—p. 724.
Postsulfapyridine Anuria: Case Report. S. K. Sundaram.—p. 726.
Prevailing Types of Pneumococci in Pneumonia and Pneumococcic Infections. R. B. J. Lal and N. L. Chitkara.—p. 728.
Blackwater Fever in Darjeeling Terai. J. C. Bhattacharjee.—p. 734.
Stains Other Than Blood Stains as Medicolegal Evidence. S. D. S. Greval and S. N. Chandra.—p. 737.
Method of Oiling Streams and Drains by Automatic Drip System. A. K. Misra.—p. 739.

Sulfaguanidine in Cholera.—Of 613 patients with cholera that Chopra and his associates treated, 301 were given 0.5 Gm. of sulfaguanidine as an initial and 0.25 Gm. every six hours for seventy-two hours as a maintenance dose; 218 were given 1 Gm. of the drug as an initial and 0.5 Gm. as the maintenance dose, and 94 control patients were treated only with saline solution intravenously. Of the first group of patients 282 were cured and 19 died, of the second group 211 were cured and 6 died and of the last group 88 were cured and 6 died, making the respective mortality rate 6.31, 3.21 and 6.38 per cent. The patients given the larger doses of sulfaguanidine required less saline solution than the two other groups. All the patients receiving chemotherapy had fewer stools per day. Larger doses than those used may be still more efficacious.

Journal of Hygiene, London

41:463-622 (Nos. 5 and 6) (Dec.) 1941

Comparison Between Direct and Indirect Occupational Risk in Mortality from Pulmonary Tuberculosis. E. A. Cheeseman.—p. 463.
Chemical and Physical Investigation of Germicidal Aerosols: I. Germicidal Smokes. S. R. Finn and E. O. Powell.—p. 473.
Freezing of Human Serum and Plasma in Medical Research Council Transfusion Bottles, Before Drying by Sublimation from Frozen State. R. I. N. Greaves.—p. 489.
Further Observations on Longevity of Dry Spores of Bacillus Anthracis. G. S. Graham-Smith.—p. 496.
Papillary Variation in Coliform Bacteria. F. H. Stewart.—p. 497.
Experiments in Connection with Attempt to Produce Neurotropic Strain of Vaccinia Virus in Sheep. E. C. Smith, E. S. Horgan and M. A. Haseeb.—p. 509.
Detection of Acetylmethylcarbinol in Bacterial Cultures: Comparative Study of Methods of O'Meara and of Barritt. C. G. Batty-Smith.—p. 521.
History of Six Old Cultures of Mycobacterium Tuberculosis. A. S. Griffith.—p. 530.
Milk Spread Epidemic of Scarlet Fever. R. Douglas, J. Smith, I. N. Sutherland and R. J. P. Watson.—p. 543.
Outbreak of Paratyphoid B Fever. C. B. Hogg and R. Knox.—p. 553.
Examination of Modified Eijkman Method Applied to Pure Coliform Cultures Obtained from Waters in Singapore. G. E. Boizot.—p. 566.
*Infectious Diseases in Semiclosed Community. S. Thomson and A. J. Glazebrook.—p. 570.

Infectious Diseases in Semiclosed Community.—In the course of a year Thomson and Glazebrook observed 1,902 cases of tonsillitis and 115 cases of rheumatic fever in a training center with an average population of 1,200. The center had dormitories, classrooms, recreation rooms and hospital accommodations. All the recruits were passed as fit before entry. A quota from every batch of entrants was received at fortnightly intervals at this center. This probably played an important part in continuing the epidemic. The incidence of tonsillitis fell as the ages of the entrants rose. As the ages rose the incidence of tonsillitis among those not previously attacked fell in a geometric progression. Violent exposure to streptococcic tonsillitis in the absence of a clinical attack raised the resistance to a high level in a short time. Acute rheumatism did not appear among those who had been in the institution for a long time and had experienced several attacks of tonsillitis. There was no real difference in the incidence of the two diseases in boys drawn from different parts of the country. An epidemic of common cold did not occur in an institution in which conditions were favorable to its spread, but a severe epidemic of tonsillitis occurred during the period of investigation. In this institution the incidence of the common cold was related to the seasons, yet the conditions of living were the same all the year round. The attack of common cold left little or no resistance. There was no "silent" immunization against the common cold.

Lancet, London

1:159-188 (Feb. 7) 1942

*Peritoneoscopy: Report Based on 125 Cases. R. M. Walker and P. L. Playfair.—p. 159.
Mass Radioscopy in Factories: Two Small Surveys. A. S. Hall.—p. 161.
Blood Viscosity. P. Evans.—p. 162.
Well Leg Extension for Fractured Pelvis: Improved Splint. W. E. Joseph.—p. 166.
Chronic Meningococcic Infection: Two Cases. A. S. Watts.—p. 168.
*Incidence of Clinical Acne in Men. E. L. Cohen.—p. 168.
Effect of Electrotherapy on Denervated Muscles in Rabbits. E. Gutmann and L. Gutmann.—p. 169.

Peritoneoscopy.—Walker and Playfair performed peritoneoscopy under local anesthesia in 95 cases, under general in 29 and under spinal in 1. General anesthesia was employed when it was probable that open operation would follow. Peritoneoscopy is usually called for as an alternative to an exploratory laparotomy and should be employed only when definitely indicated. It will save many patients the risk and discomfort of an open abdominal exploration. The authors have not encountered any serious complications, the only minor one being surgical emphysema of the abdominal wall in a few cases. Peritoneoscopy was found particularly useful in gastric and hepatic conditions. Of 32 patients with gastric carcinoma examined 9 showed metastasis and were considered inoperable. In 20 no metastasis was seen and laparotomy was undertaken; 11 had a subsequent gastrectomy, while at operation 9 were found inoperable because of an extension of the growth not seen through the peritoneoscope. In 2, no growth was seen with the peritoneoscope, but operation revealed a carcinoma; 1 patient without metastasis was not operated on because of a poor general condition. Of 18 patients with either palpable enlarged livers or ascites 10 showed malignant nodules, 4 cirrhosis, 2 hepatitis and 2 fatty degeneration. Of 8 with suspected cholecystitis or gallstones 6 showed a pathologic gallbladder, confirmed at operation, while in 2 the gallbladder appeared to be normal but at operation it was found to contain a single stone. The ovaries of 16 were examined; 8 because of menstrual irregularities, in 6 of whom multiple unruptured graafian follicles were revealed and in 2 polycystic ovaries, and 8 for ovarian cysts, 3 of which were malignant with peritoneal metastasis, while in 5 the diagnosis was confirmed and the cyst subsequently removed. In 2 other patients who had had malignant ovarian cysts removed previously metastasis was found and confirmed at necropsy in 1. Of 8 patients with cervical or uterine carcinoma 3 had peritoneal metastasis, 1 hepatic metastasis and 4 evidence of invasion of the broad ligament. Other conditions which have been diagnosed were ectopic pregnancy, metastatic retroperitoneal melanotic sarcoma, tuberculous peritonitis, tuberculous salpingitis, endometrioma and splenomegaly.

Incidence of Acne in Men.—Cohen states that among 391 soldiers that he examined 59 had obvious acne vulgaris. The ages of the last 207 varied from 20 to 39 years. It seems that most authorities have put the upper age limit too low and that acne is relatively common in men more than 30; 8 of 51 men between 30 and 39 had acne.

Archivos de Medicina Interna, Havana

6:255-316 (Sept.-Dec.) 1940

*Coarctation of Aorta. F. Sala-Panisello and E. González-Peña.—p. 255.
Epidemic Megalerythema: Infectious Erythema: Fifth Disease. J. de Castro Palomino, J. A. Armenteros and L. Expósito.—p. 275.
Considerations of Radiologic Diagnosis of Persistence of Arterial Canal. J. Govea-Peña Font and V. Font.—p. 282.
Paroxysmal Hemoglobinuria Due to Cold. F. López Fernández and R. Dorticós.—p. 287.
Chronic Aleukemic Myelosis. L. E. Pascual Gispert and L. Diaz de Villegas.—p. 293.
Arthritic Form of Leukemia. M. Machado Espinosa, S. Tallet Grenier, E. León León and E. López Hidalgo.—p. 300.

Coarctation of the Aorta.—Sala-Panisello and González-Peña point out that coarctation of the aorta was as a rule detected accidentally in the course of a necropsy until modern methods of examination made its detection during life possible. They present a review of the literature on stenosis of the aortic isthmus and a classification of congenital anomalies of the heart. The prognosis is somewhat unfavorable because of the possibility of a bacterial endocarditis. As prophylaxis, removal of all foci of infection is indicated. Digitalization may be required in some cases in order to maintain the hemodynamic equilibrium. The authors present the clinical history of a man aged 20 in whose shoulder a collateral circulation was discovered.

Boletín de la Soc. de Obst. y Ginec., Buenos Aires

20:699-878 (Dec. 30) 1941. **Partial Index**

*Placental Blood Transfusion: Indications in Tocologic and Gynecologic Diseases. G. Ricci and M. Balaguer.—p. 850.

Placental Blood Transfusion.—Ricci and Balaguer believe that placental blood because of its high hormone content is of therapeutic value in obstetric and gynecologic diseases. The blood is aseptically collected from the placenta immediately after delivery. It is preserved in a solution of 5 Gm. of sodium citrate, 9 Gm. of sodium chloride and sufficient amount of twice distilled water to make 1 liter. The mixture of blood for transfusion contains the same amount of blood and of the sodium citrate-sodium chloride solution. It can be preserved for five days. Placental blood of the same group or from universal donors is used. Blood serum is obtained from centrifugated blood of the groups A, B and AB. It can be used without regard for blood grouping. Blood or blood serum is transfused in amounts of 20 cc. every other day up to a total of six to ten transfusions. The treatment was given to ambulant patients with chronic and subacute adnexal disease, and disorders of menstruation. The patients exhibited transient local and general reactions of malaise, fever, aggravation of local pain and local inflammation which lasted for a few hours. The reactions diminished in severity as the treatment progressed. By the end of the treatment local pain, inflammation, vaginal discharge and swellings disappeared. Menstruation became regular and the patients were able to lead a normal active life. Recurrences were observed in 2 of 32 cases and were due to insufficient treatment. A new series of six transfusions completed the cure. In cases of juvenile and menopausal metropathies previous treatment and blood transfusion had failed. Placental blood transfusion controlled the hemorrhages and regulated menstruation. Good results were also obtained in grave puerperal pyelitis after failure of the usual treatments, including sulfanilamide.

Revista Médica de Chile, Santiago

70:1-100 (Jan.) 1942. **Partial Index**

Vascular Disorders of Extremities. A. Velasco S. and E. Acevedo D.—p. 3.
*Diagnosis and Treatment of Peripheral Arterial Disorders. R. Zúñiga Latorre.—p. 18.
Surgically Treated Subdural Hematomas: Four Cases. I. Alessandrini and H. Lea-Plaza.—p. 24.
*Sulfadiazine in Treatment of Meningococcic Meningitis. A. Horwitz, J. Perroni, R. Kraljevic and J. Garcia Huidobro.—p. 31.

Diagnosis and Treatment of Peripheral Arterial Disorders.—Zúñiga Latorre discusses the treatment of acrocyanosis, erythromelalgia (Weir Mitchell), Raynaud's disease, thromboangiitis obliterans, localized obliterating arteriosclerosis, generalized obliterating arteriosclerosis, syphilitic arteritis and diabetic arteritis. Although these disorders represent distinct clinical entities, from the point of view of pathologic anatomy they are gradations of an arteritis which is functional in the beginning, spasmatic in its later course, obstructive and causing in the end stages, grave lesions in the arterial coats. The etiology of the syphilitic and diabetic arteritis is known; the cause of the others has not been determined. The author has treated surgically since 1927 107 cases. In his experience ganglionectomy gives the maximum assurance of cure in thromboangiitis obliterans while the operative risk is small. Medical treatment must complement the surgical but by itself cannot cure the thromboangiitis. There exist two causes of vascular spasm in thromboangiitis obliterans: a general, endocrine, adrenal, which maintains the hypertony of the sympathetic, and a local arterial, which originates in the nervous fibers of the wall and is brought on by an obstruction of an artery, which in turn provokes a spasm in the entire collateral network. The effect of the surgical treatment on the latter is so certain and permanent that it counteracts to a large extent the primary cause and prevents grave alterations. Moreover, ganglionectomy seems to exert a direct influence on the general cause. The author tried to induce both effects in some patients by performing a paravertebral ganglionectomy to eliminate the second cause of spasm, and splanchnicectomy, freeing or extirpating the semilunar ganglion to attenuate the first. The results obtained have been optimal, but the majority of cases demonstrated that ganglion extirpation to the customary extent is sufficient to obtain definite clinical improvement. The operation is indicated in all cases in which the collateral network still reacts. It is contraindicated in generalized arteriosclerosis and in diabetic gangrene. Medical treatment should complement the surgical therapy. Early diagnosis is important in order that surgical treatment may be performed in time to avoid mutilating amputations.

Sulfadiazine in Treatment of Meningococcic Meningitis.—Horwitz and his collaborators administered sulfadiazine in 38 cases of meningococcic meningitis. The mortality so far has been zero; this is noteworthy when it is considered that with the use of other sulfonamides the mortality fluctuates between 8 and 10 per cent. The initial dose was 4 Gm. and was followed by 1 Gm. given every three hours. The average duration of the treatment was 8.5 days. The average total dose was 60 Gm., but many cases were cured with 30 Gm. Because of the low toxicity and the favorable results sulfadiazine may eventually replace nearly all of similar drugs.

Wiener medizinische Wochenschrift, Vienna

91:677-692 (Aug. 16) 1941

Detection and Treatment of Lupus Vulgaris. A. Kropatsch.—p. 677.
Acute Abdominal Complication as Result of Embolism of Superior Mesenteric Artery. D. Antic.—p. 680.
Tropical Malaria with Symptomatology of Tuberculous Meningitis. V. B. Kurdoglu.—p. 682.
*Atropine and Iron in Treatment of Gastric Ulcer. A. Henszelmann.—p. 684.

Atropine and Iron in Treatment of Gastric Ulcer.—It is not generally appreciated that in large doses atropine exerts a therapeutic effect by way of the sympathetic. It has a paralytic effect on the parasympathetic nerve terminations. In this way a spasmolytic effect is exerted on the smooth muscles, and the secretion of the digestive glands is inhibited. The spasms of the smooth musculature, irritation of the antrum, hypertonia, insufficient opening of the pyloric sphincter and the contraction of the antrum are the result of nervous hyperirritability. By counteracting these spasmodic contractions with atropine rest is secured, which is necessary for the healing of the ulcer. The customary doses of atropine do not have this effect. Henszelmann found that intravenous administration of atropine sulfate solves this problem. Depending on the nature of the case, he administers daily for ten or twenty successive days from 0.33 to 0.66 mg. of a 1:1,000 solution of atropine sulfate. Reduced iron is given three times daily in doses of from 0.1 to 0.2 Gm. Intravenously administered atropine heals the peptic ulcer more rapidly than does protein treatment, amino acid or any other treatment. In the presence of hemorrhages the atropine treatment is combined with the administration of reduced iron. The ferrochloride formed by the metallic iron and the hydrochloric acid exerts a local hemostatic, astringent and coating effect; it promotes granulations and has an acid neutralizing effect. Its strengthening and hemopoietic action counteracts the predisposition to hemorrhage.

Book Notices

Encephalitis: A Clinical Study. By Josephine B. Neal, A.B., M.D., Sc.D., Associate Director, Bureau of Laboratories, Department of Health, New York, et al. Foreword by Hubert S. Howe, A.M., M.D., Clinical Professor of Neurology, College of Physicians and Surgeons, Columbia University, New York. Cloth. Price, $6.75. Pp. 563, with 16 illustrations. New York: Grune & Stratton, Incorporated, 1942.

The common worldwide and devastating disease encephalitis has become familiar to every physician. This book satisfies a present need. The difficulty in seeking information on encephalitis has not been that so little but that so much has been written on the subject. To have the accumulated information and the relevant world literature brought up to date is an accomplishment of merit.

Since 1918 Dr. Neal has been actively and prominently interested in this field. In the spring of 1927 Mr. William J. Matheson, himself a sufferer from encephalitis, gave generously to make possible exhaustive study of this disease. As executive secretary of the commission established by his grant, Dr. Neal and her associates could give their entire attention to the care of more than 700 patients afflicted with the disease. In addition, her experience with more than 200 patients who had acute infections of the central nervous system as diagnosed by the members of the Division of Acute Infections of the Central Nervous System of the Bureau of Laboratories, Department of Health, New York City, of which Dr. Neal is in charge, gave her the background necessary for an appraisal of the problem. No other person has had such wide experience in this field. The presentation in a single volume of such a wealth of experience in itself reflects thoughtful preparation of the work.

The book is introduced by historical and clinical orientation of encephalitis. Dr. Ralph S. Muckenfuss next considers the epidemiology of the various types of epidemic encephalitis. Chapter III, written by Dr. Neal and Dr. Helen Harrington, deals with the neurologic complications that may follow measles, German measles, vaccination, smallpox, antirabic treatment, whooping cough, scarlet fever, pneumonia and other bacterial infections. In chapters IV and V Dr. Neal covers the clinical course and the medical treatment admirably and includes the results of a vast amount of long, difficult and original work. The salient features of the surgical treatment of postencephalitic symptoms are briefly but, for the medical reader, adequately presented by Dr. Tracy J. Putnam. In chapter VII Dr. Albert A. Rosner deals with the psychiatric sequelae of epidemic encephalitis, and in the next chapter Dr. Lauretta Bender provides the reader with an informative survey of the postencephalitic disorders in behavior of childhood.

In the last chapter Dr. Lewis D. Stevenson describes clearly and well, with the help of illustrations, the pathology of encephalitis lethargica, congenital and infantile encephalitis, hemorrhagic encephalitis, St. Louis encephalitis, Japanese encephalitis, influenzal encephalitis, acute disseminated encephalomyelitis and neuromyelitis optica, multiple sclerosis, the encephalitis of measles and German measles, postvaccinial (cowpox) encephalitis, the encephalitis of smallpox, chickenpox, mumps, scarlet fever, choriomeningitis, typhus fever, Rocky Mountain spotted fever, rheumatic fever and chorea, equine and other animal types of fever transmissible to man, rabies, louping ill, psittacosis, virus myelitis, tularemic encephalitis, animal encephalitis not transmissible to man, encephalitis of malaria, trichinosis and cysticercosis, toxoplasmic encephalomyelitis, trypanosomiasis, purulent encephalitis, the North Dakota epidemic, the Guillain-Barré syndrome, some less usual forms of encephalopathy and botulism.

It will be seen that the book covers much territory, but it does this well and with evidence of authoritative acquaintance with most of the material. The more recent views concerning the place of nutritional deficiencies in the brief reference to Wernicke's syndrome are omitted. This condition, however, belongs to a group that is not related primarily to infections. The book is well indexed. It is widely useful, and most physicians will find in it the information they are likely to seek expressed in words they will understand.

Anquilostomiasis y paludismo en Venezuela. Por el Dr. R. B. Hill y Dr. E. I. Benarroch. Paper. Pp. 204, with illustrations. Caracas: Editorial Elite, 1940.

This book contains a general outline of conditions affecting health in Venezuela, including topography, climate, living conditions, population in general and the activities of the public health department followed by reports of hookworm and malarial surveys carried out in 1927-1928 in Venezuela by the International Health Division of the Rockefeller Foundation in collaboration with the Venezuelan National Health Department. Following the introductory statement there appears a bibliography of articles published separately by the authors in various journals in South America and the United States during the period 1928-1934 inclusive. Four of these articles are reproduced in an appendix.

The first three chapters of the book, setting forth acknowledgments, discussing general conditions and dealing with the activities of the Venezuelan Health Department, are a frank discussion of public health in Venezuela, the failure of administration of public health measures by the Public Health Department, and of the developments necessary to improve the public health in that country. Chapter IV is a report of findings of an extensive hookworm survey in the northern coastal and plain states, the mountainous areas of Lake Maracaibo northward to the Caribbean Sea, and the state of Bolivar lying south of the Orinoco River. The high incidence of hookworm infection found throughout most of these areas, making up an average of 69 per cent infection of the 11,235 individuals examined, is astounding. Chapter V is the report of the study of malaria carried out for the same general area and is an excellent presentation of the malaria situation in Venezuela, including the prevalence of malaria as based on more than four thousand spleen examinations and more than three thousand three hundred blood studies, the species and the distribution of species of anophelines and a discussion of the agricultural and industrial practices producing large breeding areas for anopheline mosquitoes. Chapter VI is a more detailed report of general health conditions and especially of malaria and anopheline mosquitoes in the general area of the city of Maracay. An appendix in chapter VII deals with various notes of interest, such as a report of the necropsy in a case of cerebral malaria, an experiment with epinephrine for the reactivation of malaria parasites and the use of quinine. The articles reproduced in this appendix discuss the various anopheline mosquitoes found in Venezuela, the feeding habits of Venezuelan anophelines, notes on the frequency with which various malarial parasites are encountered and a study of the various malarial parasites and notes on their frequency.

This book is recommended as presenting a comprehensive picture of general health conditions in Venezuela with detailed information on hookworm, malaria and the anopheline mosquitoes. The binding and paper are poor, and the photography, while adequately giving an impression of the great health problems to be encountered in Venezuela, is of inferior quality. Numerous tables and charts summarize the surveys. Vital statistics based on official reports of the Venezuelan Health Department are obviously inadequate.

Anatomy of the Nervous System: A Textbook from the Developmental and Functional Point of View and Atlas of the Nervous System of Man. By Olof Larsell, M.A., Ph.D., ScD., Professor of Anatomy, University of Oregon Medical School, Portland. Cloth. Price, $6.50. Pp. 443, with 341 illustrations. New York & London: D. Appleton-Century Company, Inc., 1942.

This is a revision and enlargement of a previous book by Larsell, "Textbook of Neuro-Anatomy and the Sense Organs," reviewed in THE JOURNAL, May 20, 1939. Although the present volume is an improvement over the previous one, a number of the confusing statements pointed out in the first review still persist in this volume. On page 103 is the statement that "injury to the [spinal] cord which affects this tract [the anterior spinothalamic] results in failure of tactile and pressure stimuli to reach the brain," while on page 116 it is stated that, with destruction of the anterior spinothalamic tract, "touch and pressure sensibility remain virtually intact" because "this type of sensibility, however, is also served by fibers in the posterior funiculus." And on pages 104 and 105 Stopford is quoted with

approval to the effect that the fasciculus gracilis and fasciculus cuneatus, the principal tracts of the posterior funiculus, have to do only with position senses and two point discrimination. The reviewer is aware that these apparently contradictory statements are, at least in some measures, susceptible of explanation, but does the first year medical student for whom this book was written know it? Neuroanatomy is one of the most difficult subjects that the young student encounters. Every effort should be made to have this intriguing and important subject as interesting and as free from confusion as possible.

Although the important lateral spinothalamic tract has been added to figure 112, it is still not indicated on most of the diagrammatic figures of the brain stem (figs. 110, 114, 116, 119, 123). The erroneous implication that Walker and Le Gros Clark found evidence that some of the fibers of the optic radiation to the calcarine cortex arise in the pulvinar has also been allowed to persist (p. 292).

These points are particularly annoying in that they persist in spite of having been called to the author's attention. They are not serious perhaps, but they are not the only inconsistencies. For example, on page 254 is the erroneous statement that the posterior lobe and pars nervosa of the hypophysis are synonymous; on page 260 that the basal ganglions are found in the floor and ventrolateral wall of the cerebral hemisphere; on page 268 that the external capsule lies between the thalamus and the claustrum, to mention a few.

On the whole the book is carefully written. The illustrations are well chosen and well reproduced. There is a good bibliography and a useful index. The volume will prove to be a useful textbook for students in neuroanatomy.

Atti del Convegno sulla silicosi, Torino, 22-23 febbraio 1941. Edizione dell' Ente nazionale di propaganda per la prevenzione degli infortuni. Cloth. Price, 60 lire. Pp. 236, with illustrations. Turin: S. A. N. Stamperia Artistica Nazionale, [n. d.].

The convention reported in this publication represents an attempt to bring together physicians, engineers, chemists, physicists, jurists, sociologists and economists for a discussion of the problem of silicosis in industry.

The collection of papers presented cannot readily be construed as an extension of the already existing knowledge of the disease; rather, it is an affirmation of its vital and ever increasing significance and a recognition of the varied sources from which must come contributions toward its ultimate solution.

The papers possess a commendable degree of homogeneity, consecutiveness and readability despite their multiplicity of authorship. They are in essence a compilation of basic information—a summary of the salient issues presented by the disease. Among the phases specifically considered are the pathology of silicosis, roentgenologic diagnosis, clinical diagnosis, prevention, medicolegal evaluation and insurance and employer liability.

It is obviously difficult to abstract from the reports items of preeminent general interest. The individual reader with individual interests will naturally find points of value on the basis of his own relation to the problem and his own predilections. References to the context are therefore of more or less arbitrary selection and are offered not with the implied suggestion that they are the primary contributions of the work but with the view of merely indicating the range and character of the material the reports cover.

In the paper on pathologic considerations, Professor Mottura of the Royal University of Turin refers to the slight compromise of pulmonary function attributable to the silicotic nodule per se. He makes mention of the alveolar compression and final obliteration consequent to massive sclerotic changes. Reference is also made to the possible difficulty of detecting slight tuberculous disease in the silicotic lung.

The need of supporting the roentgenologic findings by an adequate anamnesis before a definite diagnosis of silicosis can be made is mentioned by Professor Lupo of the Maggiore Hospital of Novara.

Concerning the removal of the affected subject from his work, Professor Vigliani of the University of Turin urges the reminder that such removal does not guarantee arrest of the process nor does it obviate the danger of tuberculosis. The psychic dangers to the worker, the possibility of seeking employment by concerns less meticulous in their examination and the danger of doubling the number of the silicotic through replacement of affected workers by others are discussed.

Professor Baader of the University of Berlin states that the number of grave cases of silicosis in the old reich reported during the first nine years following the legal institution of compensation for such cases was 38,500 and that up to January 1938 the benefits paid to the silicotic and their heirs amounted to 65,000,000 marks. He avers that "the fight against dust is impossible without good organization and without methodical instruction of the workmen."

The reports of the Turin convention are of primary interest to the industrial physician and others directly concerned with the ever important question of silicosis. However, the papers could be read with profit by the internist and the student of pulmonary disease.

Clinical and Experimental Histological Studies on Effects of Salicylate and Quinine on the Ear. By Jørgen Falbe-Hansen. Translated from Danish by Hans Andersen, M.D. Denne Afhandling er af det lægevidenskabelige Fakultet antaget til offentlig at forsvares for den medicinske Doktorgrad, København, 1941. Paper. Price, 10 Danish kroner. Pp. 216, with 12 illustrations. Copenhagen: Einar Munksgaard, 1941.

The war apparently has not been able, even in Europe, to smother entirely the type of detailed clinical study represented by this monograph, which evidences a great deal of work and is in the true continental style with full preliminary remarks on the pharmacology of the drugs investigated, namely salicylic acid and quinine; and it includes an extensive critical survey of all available pertinent preexisting contributions on the subject of the author's studies. He then relates the manner in which he tested hearing and labyrinthine functions in order to establish normal criteria. Under proper controls both tuning forks and the audiometer were used; healthy volunteers were examined after ingestion of sodium salicylate and quinine sulfate; patients with abnormal hearing were similarly tested and there were a number of instances in which individuals with acute quinine poisoning and protracted salicylate ingestion were observed. There were, in addition, controlled animal experiments with microscopic examinations of the internal ear after lethal doses of quinine sulfate and sodium salicylate. The author's conclusions were that, in the main, 0.6 to 1.5 Gm. of quinine sulfate as a single dose or fractionated over a period of six hours produced deafness of the conduction type which, as a rule, cleared up in twenty-four hours. The same was true of single or fractionated doses of sodium salicylates to the amount of 3 Gm. or over. No permanent aural changes were noted. The microscopic studies show changes in the cells of the spiral ganglion, in the organ of Corti and in the position of the membranes. Hypothetically this may be due to an increase in secretion of the labyrinthine fluids, especially the perilymph induced by the drugs used. The increased endolabyrinthine pressure acts on the fenestra and explains the aural findings. Those interested in the effects of quinine and salicylates on the ear should read this work. It seems carefully done and differs in its conclusions from commonly accepted opinion to date, which appears to feel that quinine and the salicylates, when they adversely affect the hearing mechanism, produce a perception type of deafness which is often more or less permanent.

From Infancy Through Childhood. By Louis W. Sauer, M.D., Ph.D., Assistant Professor of Pediatrics, Northwestern University Medical School, Chicago. Cloth. Price, $2. Pp. 200, with 17 illustrations. New York & London: Harper & Brothers, 1942.

This book was written for mothers who are intelligent enough and well educated enough to use a book of advice in connection with the rearing of a child. It is not planned to replace the physician but to aid him. The discussion takes up the care of the mother through pregnancy and the nursing period, the care of the child in infancy and through various stages of development. There are special sections dealing with the prematurely born infant and the adopted child. In the appendix are a glossary, charts concerning immunization and record of weight and height, also some information on first aid. The repute of the author gives assurance of the authoritative character of the advice given. Some sections of the book are technical, so that the mother may require a dictionary or supplementary information from her own doctor in addition to the material in the book itself.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

EFFECT OF SMOKING ON APPETITE AND ON PERIPHERAL VASCULAR DISEASE

To the Editor:—**It is claimed that smoking lessens the appetite; many women who are anxious to reduce take up smoking. How does it bring about this result? What is the effect of tobacco on metabolism, especially the metabolism of carbohydrates? Does smoking cause hyperglycemia (temporary)? Why is smoking considered harmful in peripheral vascular disease?**

M.D., Michigan.

ANSWER.—That smoking lessens appetite and interferes with weight gain is one of the few claims in cigaret advertisements which have been substantiated by clinical and experimental observations. The ill effects of the induced anorexia were discussed in an editorial in THE JOURNAL many years ago as follows: "The human appetite is a delicate mechanism, and the attempt to urge that it be aborted or destroyed by the regular use of tobacco is essentially vicious." Temporary elevation of the blood sugar following smoking—reported by several, but not all, observers—varies with the dose and the subject and seems too small to account for the effect observed. Local effects on taste buds, the mucous membranes of the mouth and the upper portion of the alimentary tract in general and on gastric secretion and motility appear more plausible. The central effect of nicotine, inducing nausea in novices, may also play a part. Some of the effect, however, may be due to psychologic mechanisms, such as preoccupation of attention on smoking diminishing the tendency to nibble or eat for psychic reasons and conditioned reflexes set up by after dinner smoking leading to the cessation of hunger pains.

The effect of smoking on peripheral vascular disease is ascribed to the peripheral vasoconstriction caused by nicotine. This is shown by pallor, reduced temperature and lowered volume of the extremities after smoking. It is best exemplified in the unanimous condemnation of smoking in cases of thromboangiitis obliterans but may be noted also in other disease states and in normal persons.

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INGROWING HAIRS

To the Editor:—**A man has been troubled for the past year with a condition involving the roots of the hair of the face. He shaves every day but never seems to get a clean shave because some of the hairs have a tendency to curl on themselves and turn into the skin. They seem to become encysted and when pulled out always have a hyaline-like sack involving the root and most of the lower portion of the hair. This condition has spread. I should like to know (1) the name of the condition, (2) what can be done to prevent the hairs from growing inward and (3) what can be applied to the skin to prevent further formation of the hyaline-like sacks?**

M.D., Massachusetts.

ANSWER.—1. The condition is a common one, but there are very few articles on it in the literature. It is known as pili incarnati and commonly called ingrowing hairs.

2. The only way to prevent the hairs from growing inward is to keep them pulled out or to have them permanently removed by electrolysis.

3. There is no medication which applied to the skin will prevent the formation of the cysts, which are more often pustules. They result from the irritation caused by the penetration of the skin by the hairs; without emerging from the follicle on the skin surface the hairs often bore along in the superficial corneum, through which they can be seen as though through ground glass, or emerge from the follicle and then reenter the epidermis, forming an arch or bridge. From this point the course of the hair may be seen as it passes superficially, or it may go deeper and disappear from sight. The resulting papules, cysts or pustules are oftenest between the follicle mouths, because the hairs that emerge and then reenter the skin are more common than those that remain in the follicle or begin boring without emerging. Sometimes, however, as Weninger (Sur les poils incarnés, *Ann. de dermat. et syph.* **9**:687 [Aug.] 1928) reported, the inflammatory reaction occurs at the follicle mouth and the hair can be fished out of the center, where it has lain curled up. As mentioned by the Suttons (Diseases of the Skin, ed. 10, St. Louis, C. V. Mosby Company, 1939, p. 1394) this suggests keratosis pilaris, the horny skin-colored papules resembling goose flesh seen often on the arms about the elbows or on the outer side of the legs, sometimes elsewhere and occasionally on the cheeks and submaxillary regions, the favorite location of pili incarnati. Sofoteroff (Das Harr als Ursache von Neuralgien, *Zentralbl. f. Chir.* **55**:841 [April 7] 1928) reported on 4 patients, 2 of whom had painful nodules, the largest the size of a cherry, in the axillas; the other 2 had similar nodules in the pubic region. In these nodules, which showed no outward sign of inflammation, he found curled up hairs the removal of which relieved the tenderness and pain. This suggests an unusual form of keratosis pilaris. The lesions of pili incarnati are usually inflamed, partly because of a foreign body reaction to the presence of hair in the skin outside the follicle and partly because of external irritation from shaving and attempts to get rid of the hair. Most writers on this subject have thought of a possible relation to dystrophies of the teeth and nails and have recorded the absence of these but have not mentioned the presence or absence of keratosis pilaris in its common locations.

The reason for the localization of ingrowing hair at the side of the neck just below the jaw is that this is the meeting place of two opposing streams of hair, well depicted by Danforth (Studies on Hair, *Arch. Dermat. & Syph.* **11**:804 [June] 1925), who writes in explanation (p. 820) "The natural direction of the hair in the submaxillary region is downward, while in the lower part of the neck it is upward, the two streams meeting in a line well within the beard covered area of most men. Despite the frequent irritation that comes from shaving against the natural direction of the hair on the part of a considerable proportion of men for many generations, this peculiar arrangement, apparently not shared by apes, still persists as a characteristic human trait."

Added to the confusion of hair direction is the fact that the hair in this region emerges from the follicles at an acute angle to the surface of the skin, favoring penetration of the skin by any crooked hairs. Keratosis pilaris might cause crookedness of the hairs. Both it and pili incarnati are familial in occurrence, and the association of these two and mild forms of ichthyosis should be investigated.

SENSITIVITY TO EGG

To the Editor:—**For the past four years I have had during certain summer months a dermatitis of the hands. This varies in intensity. Not until a few months ago did I find by elimination diet that the dermatitis is due to egg in any form. Now the taking of egg in the slightest amount brings on this reaction without any seasonal relation. How can I desensitize myself, and where can I obtain the egg extract? What prognosis has the condition?**

M.D., Indiana.

ANSWER.—The diagnosis should first be confirmed beyond any doubt by eliminating egg in all forms, either as used alone or as employed in the preparation of other foods (such as cake, certain candies and ice cream). If egg is the sole cause for the dermatitis the condition should clear completely within a few days to several weeks, depending on the severity and chronicity of the cutaneous lesion. When the diagnosis is definitely established, one of two procedures may be followed. First, there should be continuation of complete avoidance of egg in any form for several months to several years. In many cases considerable tolerance to a food develops after this type of avoidance. The length of time necessary is, unfortunately, not predictable. One might try a small amount of egg after six months of its avoidance. If this is tolerated, egg may be used in the minimal amount necessary for a comfortable diet. It is inadvisable to attempt to approach the threshold of symptoms if tolerance is gained.

The second method is oral desensitization. It is not possible to give a definite dose schedule that can apply to the individual case. The slower the immunization the more likely it is to be effective. For the extremely sensitive person one might suggest that a drop of raw fresh egg white be added to a quart of water and a teaspoon of this dilution taken on an empty stomach once a day. If no symptoms occur the dose is doubled the next day by adding 2 drops of egg white to a quart of water. The

increase is continued in this manner until symptoms appear. With the first appearance of redness or itching of the hands the taking of egg white is discontinued until the lesions clear. A dose about two-thirds to one-half the one producing symptoms may then be taken daily, with occasional attempts to increase it. If after a number of trials the threshold of tolerance is found to be the same as in the original experience, no attempt should be made to increase tolerance. The maintenance dose should then be about 50 per cent of the threshold dose. This is replaced by egg as used in the preparation of foods rather than a daily intake of raw egg white. Parenteral injection of egg white or other foods in an attempt to gain tolerance not only is usually unsuccessful but is often dangerous.

BITE OF A SHEEP TIC AND PROBABLE ERYSIPELOID

To the Editor:—**While shearing sheep about three months ago a young man felt an insect bite him on the right hip. As soon as he was through he examined the spot and found a tick with its head buried in the skin. He pulled the tick off, but the insect's head broke off and remained embedded in his skin. He attempted to remove the head but was unsuccessful. A small ulcer developed at the site of the bite and has not yet healed. About a week later he began to feel sick and a little feverish and has continued to feel that way, although he has been well enough to do most of his work. A few days before he came to see me he noticed a rash on the thighs. The past history was noncontributory. Examination showed no abnormalities except a slight elevation of the oral temperature (99.6 F.) a macular eruption on the thighs, the lower part of the abdomen and the arms and the unhealed ulcer. There was no adenopathy. Blood was sent to the state laboratory in Hartford for Wassermann and agglutination tests. The Wassermann reaction was negative, and reactions for typhoid O and H, negative; for paratyphoid A and B, negative; for brucellosis, negative, and for tularemia, negative. The Weil-Felix test gave in a dilution of 20 a 4 plus reaction, in a dilution of 40 a 3 plus reaction, in a dilution of 80 a reaction of 2 plus and in a dilution of 160 a ± reaction. The Weil-Felix test was performed on the X19 strain of Proteus vulgaris. I feel that the patient must have a rickettsial infection of some sort. I do not believe it can be typhus fever because he has not been sick enough. Have you any suggestions as to further diagnostic procedures, diagnosis or treatment? Would it be worth while to try giving him sulfathiazole?**

Norman P. Rindge, M.D., Clinton, Conn.

ANSWER.—It is not certain whether the insect in question was a tick. Tick bites ordinarily do not hurt, and many hours are required before the head is buried in the skin. It is possible that the insect was a sheep "tick," which resembles a tick but is actually a wingless fly. Its bite is painful, like that of the horsefly, and its head does become embedded.

The brief clinical description of the case does not resemble that of any known rickettsial disease either in its characteristics or in its long duration. The low titer of the Weil-Felix reaction is not conclusive. Incidentally, typhus fever, like any other infection, varies greatly in severity and may indeed be so mild as to pass unrecognized.

In diagnosis several diseases may be considered. First of all is erysipeloid, or swine erysipelas, which is commonly found among fish handlers and abattoir workers (Klauder, J. V.: Erysipeloid as an Occupational Disease, THE JOURNAL, Oct. 8, 1938, p. 1345). The causative organism has been found in sheep (Prausnitz, quoted by Pick, E.: *Dermat. Wchnschr.* **35**:292, 1927) but no reports of actual infection from sheep are available.

Undulant fever is a possibility but not a very likely one. The ulcer may be secondarily infected with a fungus or kept open by the abrasive action of clothing. The possibility of a "new" disease is also to be considered.

Further diagnostic procedures would be attempts to culture the causative organism from the lesion. Sulfonamide therapy would be purely empirical if the cause was not discovered and experimental if it was discovered.

VACCINE IMMUNIZATION

To the Editor:—**What diseases do we prevent by immunization in vaccination?**

M.D., New York.

ANSWER.—The procedures generally regarded as the most reliable for active immunization are those used for the prevention of smallpox, scarlet fever, diphtheria, whooping cough, tetanus, cholera, typhoid and the paratyphoids, typhus fever and rabies. There are also preventative vaccines which are less commonly used and which are not generally available commercially. In this group is the vaccine provided by the United States government for protection against Rocky Mountain spotted fever and also one for the prevention of yellow fever. Vaccine for immunization against typhus fever has only recently become available on a large scale.

HEMOGLOBIN ESTIMATION

To the Editor:—**I have in my office the colorimeter, the Sahli and the Dare instruments, along with the Hellige type which used the ordinary colored standards of solid glass. Could you give me information as to which of these instruments is the most desirable for use for the average practitioner not especially trained in the use of the colorimeters but who wishes one that is rapid and reasonably accurate?**

M.D., Idaho.

ANSWER.—Satisfactory hemoglobin estimations for all clinical work can be made with any accurately standardized hemoglobinometer. The instrument used should be adjusted so the hemoglobin value of a normal subject with a red cell count of 5,000,000 reads 100 per cent. A hemoglobinometer can be standardized in any laboratory by making a correct erythrocyte count and hemoglobin estimation in grams on at least ten normal persons as illustrated in the following example:

Patient No.	Erythrocyte Count in Millions	Hemoglobin in Grams per 100 Cc. of Blood
1	4.92	15.1
2	5.80	16.9
3	5.02	15.5
4	5.31	16.5
5	4.57	14.2
6	4.23	13.5
7	4.78	15.0
8	5.50	16.8
9	4.65	14.9
10	4.00	12.6
Mean	4.88	15.1

The hemoglobin in grams per hundred cubic centimeters in the example cited is thus 15.4 Gm. corresponding to 5,000,000 erythrocytes. If a colorimeter is employed for the determination, a disk or standard with a color value corresponding to 15.4 Gm. per hundred cubic centimeters could be utilized. A Dare instrument is difficult to standardize, but the same principle may be used.

The Sahli type instrument should have a glass standard. A square tube preferably marked in grams should be used to insure a uniform internal diameter. The calibration of the tube should be checked as described.

The Sahli hemoglobinometer if correctly made and standardized is probably the method of choice in most small laboratories. The principal difficulty with the original Sahli type is in telling when the match is correct as the specimen is diluted. This objection is overcome in the Sahli-Haden hemoglobinometer by the use of three color standards corresponding to 105, 100 and 95 per cent. The Haden-Hausser hemoglobinometer utilizes the Sahli principle of reading the hemoglobin as acid hematin but employs a fixed dilution of the unknown blood and a wedge of colored glass corresponding to varying hemoglobin values.

Some of the photoelectric colorimeters are satisfactory but expensive. The calibration has to be done as with any other color comparison method.

Hemoglobin readings with all methods will be satisfactory if the instrument is technically correct and properly calibrated.

RESPIRATORY DISINFECTANTS FOR BRONCHITIS OF CHILDREN

To the Editor:—**Why is it that children in certain European and Latin American countries apparently cannot recover from bronchitis without numerous injections of the so-called respiratory disinfectants, such as oil of eucalyptus, guaiacol and camphor, while in the United States there is not a medical school that teaches the parenteral administration of such drugs in cases of bronchitis? Have they not proved to be valueless? I should appreciate references to any such study.**

A. Rodriguez Macedo, M.D., Mexico City, Mexico.

ANSWER.—The literature on the value of the parenteral administration of the so-called respiratory disinfectants is meager and not conclusive. Nammack and Tiber in a paper on the treatment of lung abscess by means of intravenously administered guaiacol (THE JOURNAL, July 31, 1937, p. 330), concluded that this therapy caused symptoms to subside and pathologic conditions to regress without unfavorable reactions. Most of the published studies deal with guaiacol or its esters. There is little evidence to show that when such preparations are administered orally they reach the respiratory system in any effective concentration. This was demonstrated by Bufalini as early as 1904, and the entire evidence for the use of such preparations was reviewed by the Council in THE JOURNAL, Jan. 15, 1938, page 209. The parenteral use of guaiacol dates from observations like those of Hofbauer, who found that when guaiacol was injected hypodermically a small amount of it could be found in the lungs. (*Therap. Monatsh.* **29**:237, 1915).

There is some evidence that guaiacol, if given intravenously in the proper form (free guaiacol rather than its soluble esters) and dosage, may be excreted by the lungs and appear in the sputum. However, controlled clinical studies on this phase of the problem are few. The evidence for the parenteral use of camphor and eucalyptus is negligible. It is doubted wether these drugs have any appreciable systemic action in therapeutic doses apart from reflex stimulation of the central nervous system. As a result of these meager data the parenteral use of the so-called respiratory disinfectants has not enjoyed much popularity in this country.

SENSITIVITY TO ETHYL ALCOHOL

To the Editor:—What would be the best method of desensitizing an adult person to ethyl alcohol? Sensitivity was apparently acquired by the use of a 70 per cent solution of ethyl alcohol dressings applied to compounded fracture wounds over a period of two weeks. Local applications cause a rather severe cutaneous reaction at the site of application. No reaction occurs from the use of other forms of rubbing alcohols. There is no previous history of allergy of any type. Fear of reaction has enforced total abstinence from all forms of alcoholic beverages, which were previously only rarely indulged in.

M.D., Illinois.

ANSWER.—Search of the literature reveals no report of sensitivity of ethyl alcohol per se. Ethyl alcohol is made from various foods, especially wheat, corn, rye, barley, potato and fruits. Most likely the patient, if sensitive at all, is allergic to the food from which the alcohol is made rather than to the alcohol itself. If this is true the patient should be able to consume small amounts of ethyl alcohol made from foods other than the one shown to be the cause. Cutaneous and intracutaneous tests should be done with these various foods to determine if possible the source of the allergic reaction. If all tests are negative, trials with ethyl alcohol derived from various sources should be made, using small quantities. Desensitization to ethyl alcohol has never been done, as far as is known, but it could be tried by the oral method; the alcohol could be diluted with 1,000 parts of distilled water; the first dose would be 1 drop of this dilution, followed by 2, 3, 4, 6, 9, 13 and 20 drops; then give 1 drop of 1:100 dilution and increase to 20; then the 1:10 dilution, and finally the full strength ethyl alcohol could be tried, beginning with 1 drop and increasing 1 drop each time as far as expedient. The doses could be given every other day.

Local reactions to pure ethyl alcohol are also rare but can be tested for by the usual patch test; full strength of 70 per cent alcohol can be applied to a piece of gauze and laid against the skin for forty-eight hours. Contact dermatitis to ingredients mixed with alcohol to make rubbing alcohols is not uncommon.

MIRROR WRITING

To the Editor:—I have recently had referred to me a girl aged 8 who writes backward. She is of good general health and physique. She has moderate hyperopia, of + 2.50 D. in the right eye and + 3.00 D. in the left eye, with slight esotropia of the left eye. She uses the left hand in writing. She obviously has some mental deficiency. Will you kindly give me some information about this condition—diagnosis, cause and treatment?

I. V. Berney, M.D., West Frankfort, Ill.

ANSWER.—There are two current theories of the cause of mirror writing. One of them has to do with cerebral dominance; i. e., the child is learning to use the left hand when she is really right handed by virtue of a left side speech center in the cerebrum, or vice versa. The other is interpreted in accordance with what the psychologist knows of eye and hand dominance, in that she is learning to use one hand, whereas to use the other one would be easier for her because of training and specialization factors. The visual defect would not be particularly important, except that a secondary reaction might develop from the child's mild aniseikonia. The nature of the mental deficiency would be of some importance in determination of the cause, particularly if it was due to a birth injury, but it is obviously not correctable. The usual treatment for a condition of this sort is careful diagnosis in a psychologic clinic having among its personnel both speech and reading diagnosticians and therapeutists, followed by consistent retraining pointed at overcompensation for the special malaptitude. The assistance of a neurologist who has seen similar patients is sometimes of avail but is primarily useful only when the physician works with the reading expert.

The inquirer can get in touch with the Institute for Juvenile Research, 907 South Wolcott Street, Chicago, which has throughout the state branch clinics dealing with the type of treatment mentioned, to learn the date of the clinic nearest to West Frankfort to which he can send the patient. The institute works with the referring physician.

"NORMOCHROMIC" ANEMIA

To the Editor:—Occasionally difficulty is encountered in increasing the hemoglobin and the red blood cell count in hypochromic anemia in spite of ample dosage of thoroughly potent preparations, generally an exhibition of ferrous salts. All questions of blood loss, nutritional disturbances and the like have been satisfactorily eliminated. Recently certain authors have taken the stand that some individuals normally have a lowered hemoglobin and red cell count and apparently no amount of therapy will change this finding. I refer particularly to the work of the University of Iowa Medical School workers Fowler and Barer (*Am. J. M. Sc.* **201**: 642 [May] 1941). I should appreciate some opinion as to the worthiness of the above contention.

M.D., Illinois.

ANSWER.—There is unquestionably a group of patients who have an iron deficiency anemia and who do not respond to iron therapy by an elevation of the hemoglobin content of their blood above a certain subnormal limit. If the color index or mean corpuscular hemoglobin concentration is low, one may usually attribute the lack of improvement to continued loss of blood or to defective absorption or utilization of iron or other substances necessary for hemoglobin formation. There may be abnormal hemoglobin loss or an inhibiting factor (e. g. infection). The most common cause of lowering of both red blood cells and hemoglobin so that a "normochromic" anemia exists is a chronic kidney lesion, often without albuminuria or hypertension. This condition does not improve with iron therapy. Some individuals have a low hemoglobin content of their blood over long periods of time and they are apparently in normal health. Under the circumstances this condition appears to be "normal" for these people, although it is pathologic in that it is beyond physiologic limits. It probably represents an equilibrium between the requirements of the body and its defective ability to make hemoglobin. All such cases are entitled to a thorough study to determine the cause of the abnormality. In some individuals of this type, correction of a lesion which was followed by an improvement in the hemoglobin content of the blood (lessening a tendency to bleed, removal of a chronic infection) the patients have volunteered the information that their present feeling of well being makes them believe that they had previously never known real health.

PROSTITUTION AND PREGNANCY

To the Editor:—In carrying out a program for the prevention of venereal disease, one encounters opposition to certain methods employed. In certain groups there is opposition to the use of the condom on the basis that this method prevents conception. It is my impression that, because of the high gonorrheal rate among prostitutes and the concomitant sterility pregnancy among this group of women is rare. Can you furnish any information on the relative frequency with which pregnancy has been observed in the prostitute? Of course, I am aware that it is difficult to draw a line between the professional and the "loose woman," who is also a prolific source of venereal disease.

M.D., Mississippi.

ANSWER.—Pregnancy among professional prostitutes, especially those who have followed the vocation for some time, is not common. Percentage incidence figures are not available, for obvious reasons. If pregnancy does occur, usually an abortion, intentional or unintentional, is apt to occur. This is commonly followed by salpingitis, which bars future pregnancy. In this group there is apt to be either complete sterility or one pregnancy, sterility as the result of infections which cause tubal occlusion. In a series of more than 1,000 cases of gonorrhea in the female there were thirty-one pregnancies. There were no means of knowing how many of these were prostitutes. It would seem to be a rather low incidence of pregnancy in a rather large series of exposures.

CHIGGER INFESTATION

To the Editor:—In Queries and Minor Notes in The Journal (Aug. 2, 1941, p. 406) recommendations were printed for prevention and treatment of chigger infestation. While the suggestions possess some merit where only a small number of bites are concerned, they fall short of meeting the situations arising from children on vacation and soldiers on maneuvers. The submitted suggestion deals only with the relief of itching, possibly the greatest factor in making a person *hors de combat*. Plain gasoline or carbon tetrachloride is applied with gauze or cotton by frottage to each local itching area, as if effort were made to dry clean the spot. In a minute a pleasant counterirritant effect is induced. Sleep seems to follow readily and will last three to four hours, when a second treatment is necessary, and is likely to be followed by a third application after the same time interval. New areas of itching are not infrequent as late as thirty-six to forty-eight hours and are dealt with in similar manner. Since clothing at exposure may continue to harbor the infestation, a change or rapid dry cleaning in gasoline is indicated. For availability, cost and particularly for mass application it will be difficult to excel gasoline. (I have hesitated advocating leaded gasoline for sake of caution only.) Carbon tetrachloride is nearly as efficacious and is noninflammable but should be used under well ventilated conditions. It may be of some interest to note that a drying and puckering of the lesions appear more rapidly than with other remedies suggested.

George F. Fasting, M.D., New Orleans.